CV-PCLP-5-F

RECEIVED
JUL 21 1993
OFFICE OF RCRA
WASTE MANAGEMENT DIV
EPA, REGION V

PARTIAL CLOSURE PLAN

PPG INDUSTRIES, INC.
CIRCLEVILLE OHIO

Prepared For:

PPG INDUSTRIES, INC.
Coatings and Resins
Circleville, Ohio

June 1993

Prepared By:

ICF KAISER ENGINEERS, INC.
Four Gateway Center
Pittsburgh, Pennsylvania 15222

ICF KAISER ENGINEERS

Four Gateway Center, Pittsburgh, Pennsylvania 15222

CV-PCLP-5-F

PARTIAL CLOSURE PLAN

PPG INDUSTRIES, INC.
CIRCLEVILLE OHIO

Prepared For:

PPG INDUSTRIES, INC.
Coatings and Resins
Circleville, Ohio

June 1993

Prepared By:

ICF KAISER ENGINEERS, INC.
Four Gateway Center
Pittsburgh, Pennsylvania 15222

PPG INDUSTRIES, INC.
CIRCLEVILLE, OHIO
PARTIAL CLOSURE PLAN
PLAN DISTRIBUTION LIST

Distribution to:	CV-PCLP Controlled Copy No.
Mr. Donald Schregardus, Director Ohio EPA - Central Office P.O. Box 1049 1800 Watermark Drive Columbus, Ohio 43266-0149	1-F
Mr. Brad Campbell Ohio EPA Central District Office P. O. Box 2198 2305 Westbrook Drive, Building C Columbus, Ohio 43228	2-F
Mr. Lundy Adelsberger Ohio EPA Central District Office P. O. Box 2198 2305 Westbrook Drive, Building C Columbus, Ohio 43228	3-F
Ms. Sandy Liebfritz Supervisor, Technical Support (DERR) Ohio EPA - Central Office 1800 Watermark Drive Columbus, Ohio 43266-0149	4-F
Mr. Mike Galbraith Mail Distribution Code: HRP-8J USEPA Region V 77 West Jackson Boulevard Chicago, Illinois 60604	5-F
Charles H. Waterman, Esq. Bricker and Eckler 100 South Third Street Columbus, Ohio 43215	6-F
Ms. Marian Broz Manager, Hazardous Waste Programs PPG Industries, Inc. P. O. Box 2009 4325 Rosanna Drive Allison Park, Pennsylvania 15101-2009	7-F
Mr. Bryant Riley Environmental Engineer PPG Industries, Inc. Route 23 South (Pittsburgh Road) Circleville, Ohio 43113	8-F
Mr. Robert S. Bear Project Manager ICF Kaiser Engineers, Inc. Four Gateway Center Pittsburgh, Pennsylvania 15222	9-F

PARTIAL CLOSURE PLAN
TABLE OF CONTENTS

TABLE OF CONTENTS
(Continued)

LIST OF TABLES
(Tables follow Text)

LIST OF FIGURES
(Figures follow Text)

LIST OF ATTACHMENTS

PREFACE

This Partial Closure Plan is designed to close four interim status hazardous waste management units in a manner that 1) minimizes the need for further maintenance, and 2) controls, minimizes, or eliminates (to the extent necessary to protect human health and the environment) post-closure escape of hazardous wastes, hazardous waste constituents, leachate, contaminated rainfall, or waste decomposition products to the groundwater, surface water, or to the atmosphere in accordance with the following applicable federal and state regulations:

Federal:	40 CFR Subpart G, Sections 265.110-115, 265.140-143, 265.147, 265.197 and 265.351
State:	OAC 3745-66-10 through 20 OAC 3745-66-40 through 47 OAC 3745-66-98 OAC 3745-68-51

This revision of the Partial Closure Plan incorporates the responses to all issues identified by Ohio EPA since submittal of the January 14, 1991 Plan. PPG had responded to Ohio EPA's comments in a written, itemized response format with the understanding that once concurrence was reached on all issues identified by Ohio EPA, the January 1991 Partial Closure Plan would be revised to reflect the resolved issues.

This Partial Closure Plan outlines closure procedures that were performed for the liquid waste incinerator and three drum storage areas at the PPG Circleville resin plant. This plan documents the results of the work completed through the end of 1992, as well as incorporates responses to OEPA comments in 1993 and provides risk assessment criteria to demonstrate the remaining low level residuals do not pose a threat to human health or the environment.

Since this plan is written to describe activities already performed, appropriate documentation such as analytical results for the work performed is attached.

The schedule for past work is presented with actual calendar dates to document when the work was performed. It should be noted that the overall facility closure plan, which included a partial closure plan for the liquid waste incinerator and three drum storage pads, was approved by both Ohio EPA and U.S. EPA in November 1987. All work performed to date has been in accordance with the original approved plan and continuing correspondence with OEPA.

The partial closure of the liquid waste incinerator and drum storage areas began in April of 1989 after notice from the U.S. EPA and Ohio EPA that trial burn results for the Energy Recovery Unit (ERU) were satisfactory. These areas were permitted as storage and treatment locations under

RCRA Interim Status, but will not be retained under Final Permit Status. Figure 6.1 provides a bar chart schedule for partial closure activities performed from April through November, 1989. The Ohio EPA's facility inspector was contacted in advance of crucial closure activities, such as decontamination, soil sampling or removal. The actual dates when the Ohio EPA inspector was on site are documented on the schedule. Section 6.0 of this plan also summarizes key activities that have occurred since November, 1989.

Within 60 days of completing closure activities, PPG will submit the appropriate documentation that closure has been completed in accordance with the approved closure plan (i.e., soil sample analysis results, closure certification statements). The certification by the independent professional engineer and PPG will be in accordance with OAC Rules 3745-50-42, 3745-50-42(D), and 3745-66-15, respectively.

1. DESCRIPTION OF FACILITY

PPG Industries, Inc., Coatings and Resins Group, owns and operates a manufacturing plant south of Circleville, Ohio in Pickaway County as shown on the site location map (Figure 3.1). The surrounding area is classified as industrial and agricultural. The nearest residential development is approximately one-half mile from the plant boundary. Eight major buildings are located on the property of this facility, which encompasses approximately sixty acres. The general topography of the area is flat.

The facility was originally constructed in 1962. The plant produces resins that are used in the manufacturing of paint and coating products at other PPG divisional manufacturing facilities located throughout the world. During the production of resins and paints, wastes are generated from the cleaning of process equipment, filtering of products, byproducts of reactions, and unusable finished products or raw materials.

The Circleville facility previously was permitted under Interim Status to store wastes in drums and tanks and to treat liquids by incineration. The former locations of the Liquid Waste Incinerator and the West Pad, South Pad, and Still Pad drum storage areas are indicated in Figure 3.2. Wastes from the Circleville facility possess the hazardous characteristics of ignitability, corrosivity, reactivity and/or toxicity characteristic. The incineration process destroyed the ignitable, corrosive, reactive, and organic toxicity properties of the wastes. The incinerator operated for approximately seventeen years (1971-1988) and the drum storage pads were used for periods of five to twenty-four years. The EPA Facility Identification Number for the PPG Circleville Plant is OHD004304689.

In 1987, the Energy Recovery Unit (ERU) began operation at the Circleville facility. The ERU currently receives PPG waste materials from plants throughout North America and processes them for thermal treatment by incineration. The wastes are reduced to a small fraction of their original volume, and the energy value of the waste is recovered in the form of steam to help meet the total energy requirements of the manufacturing plant.

Following the startup and operation of the ERU and the Circleville facility, five hazardous waste storage tanks were kept in service at the resin plant. The former liquid waste incinerator and three drum storage pads were closed in 1989 in accordance with Interim Status regulatory requirements and as documented in this Partial Closure Plan.

The following sections present the Partial Closure Plan for the four interim status hazardous waste management units which were closed in 1989 at the PPG Circleville site. This Partial Closure Plan presents a clean closure of the Still pad and risk assessment demonstration of clean closure of the Former Liquid Waste Incinerator, the West Drum Storage Pad, and the South Drum Storage Pad.

2. DESCRIPTION OF WASTE MANAGEMENT UNITS CLOSED UNDER PARTIAL CLOSURE

The units closed in 1989 were the Liquid Waste Incinerator, the West Storage Pad, the South Pad and the Still Pad. Closure activities included cleaning or removal of the concrete pads and the underlying soils and removal and disposal of the incinerator.

The following descriptions of the closure units are based in part on information contained in the RCRA Interim Status permit.

2.1 Liquid Waste Incinerator -- (refer to Figure 4.1 for a detailed drawing of this hazardous waste management unit)

The unit consisted of a liquid waste incinerator with three (3) lances (two for organic wastes and one for aqueous wastes), which fed wastes to the hearth. Other components of the unit included a breech, containing a temperature recorder that controlled the waste feed pumps, and a discharge stack, containing a quench water system. The incinerator had been in use since 1971. Ancillary equipment to the incinerator consisted of three (3) waste lines that fed directly into the lances and a blower that added combustion air and created air turbulence in the incinerator hearth. The incinerator area also included a concrete containment area located southeast of the incinerator pad. The topography of the area is flat. Wastes treated in the incinerator included the following:

D001 -	Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methyl isobutyl ketone, methanol, toluene or methyl ethyl ketone)
D001 - D002 D035	Aqueous Decanter Waste (aqueous phase byproduct from resin manufacturing process, containing VOCs and organic acids)
F003 -	Still sludge including xylene, ethylbenzene and methyl isobutyl ketone
F005 -	Still sludge including toluene and methyl ethyl ketone

The previous Partial Closure Plan submitted to OEPA included methanol as a component of the F003 waste listing. However, the methanol treated at the facility was only associated with the waste resin material (D001).

2.2 **Waste Drum Storage Area, Still Pad** -- (refer to Figure 4.2 for a detailed drawing of this hazardous waste management unit)

The unit consisted of a concrete pad, approximately 80' x 100', on which waste drums were stored. The pad had been in use since 1965. The area is flat. Wastes stored on the pad included the following:

D001 -	Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methyl isobutyl ketone, methanol, toluene or methyl ethyl ketone)
F002 -	Spent methylene chloride
F003 -	Incinerator brick and residue generated by the incineration of F003 wastes
F005 -	Incinerator brick and residue generated by the incineration of F005 wastes
U009 -	Waste acrylonitrile
U223 -	Waste toluene diisocyanate

Drums containing lab packs

2.3 **Waste Drum Storage Area, West Pad** -- (refer to Figure 4.3 for a detailed drawing of this hazardous waste management unit)

The unit consisted of a flat area covered by packed gravel. The storage pad was approximately 10'x100'. This unit was in use from 1975-1985. Waste stored in this area included the following:

D001 -	Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methyl isobutyl ketone, methanol, toluene or methyl ethyl ketone)
F002 -	Spent methylene chloride

2.4 **Drum Storage Area, South Pad** -- (refer to Figure 4.4 for a detailed drawing of this hazardous waste management unit)

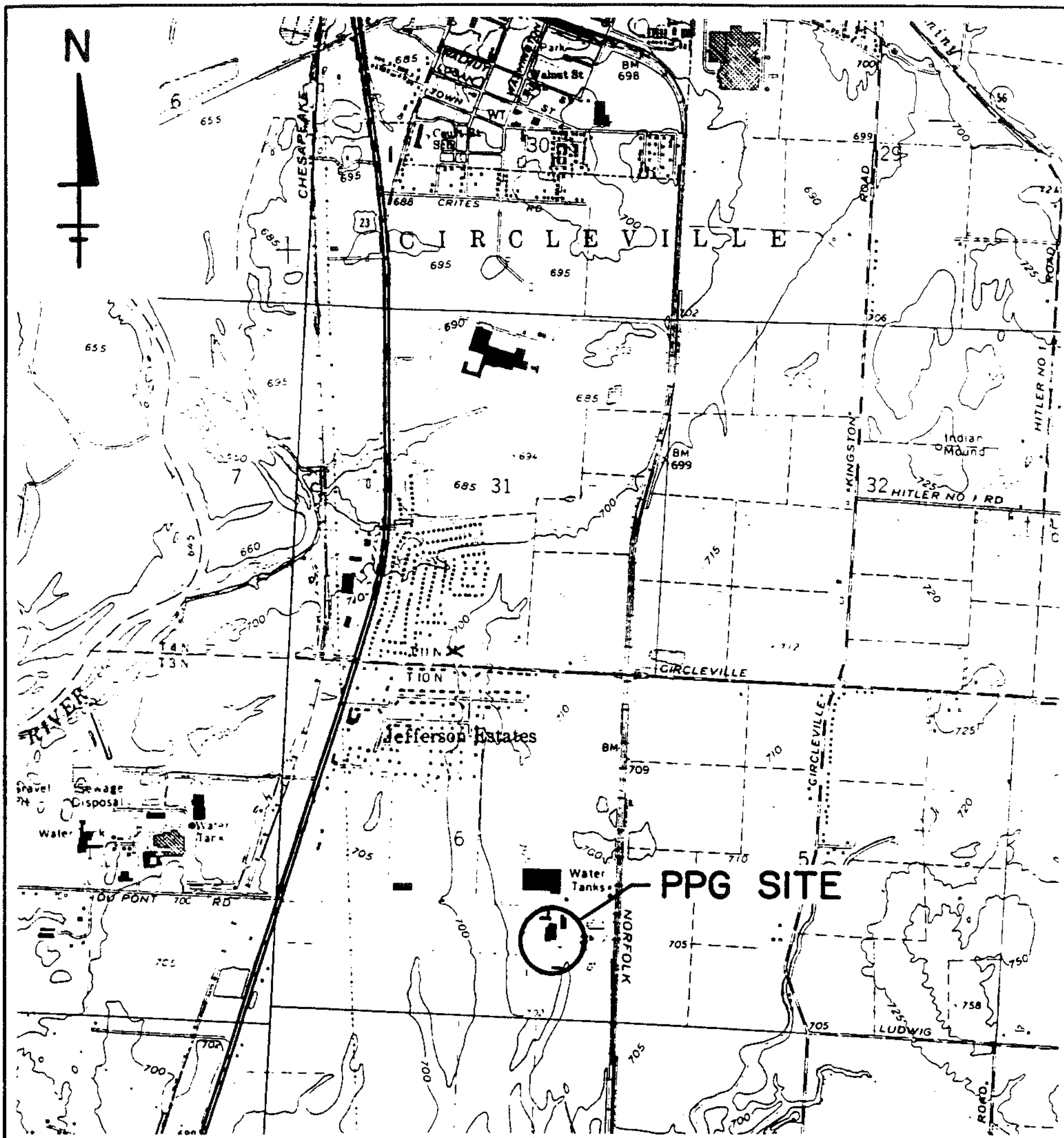
This unit consisted of a flat, packed gravel area approximately 90'x240'. This area contained a consolidation platform with a concrete containment pad underneath. The pad had been in use since 1976. Wastes stored in this area included the following:

D001 - Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methyl isobutyl ketone, methanol, toluene or methyl ethyl ketone)

3. MAPS OF FACILITY

This Section contains two facility maps as required by OEPA Closure Plan Review Guidance. These two figures locate the facility units which were closed within the site property boundaries, located in Pickaway County.

Figure 3.1 is the Facility Location Map and Figure 3.2 depicts the Interim Status Hazardous Waste Management Unit Locations, highlighting the closed units. The scales on these figures are noted.



REFERENCE

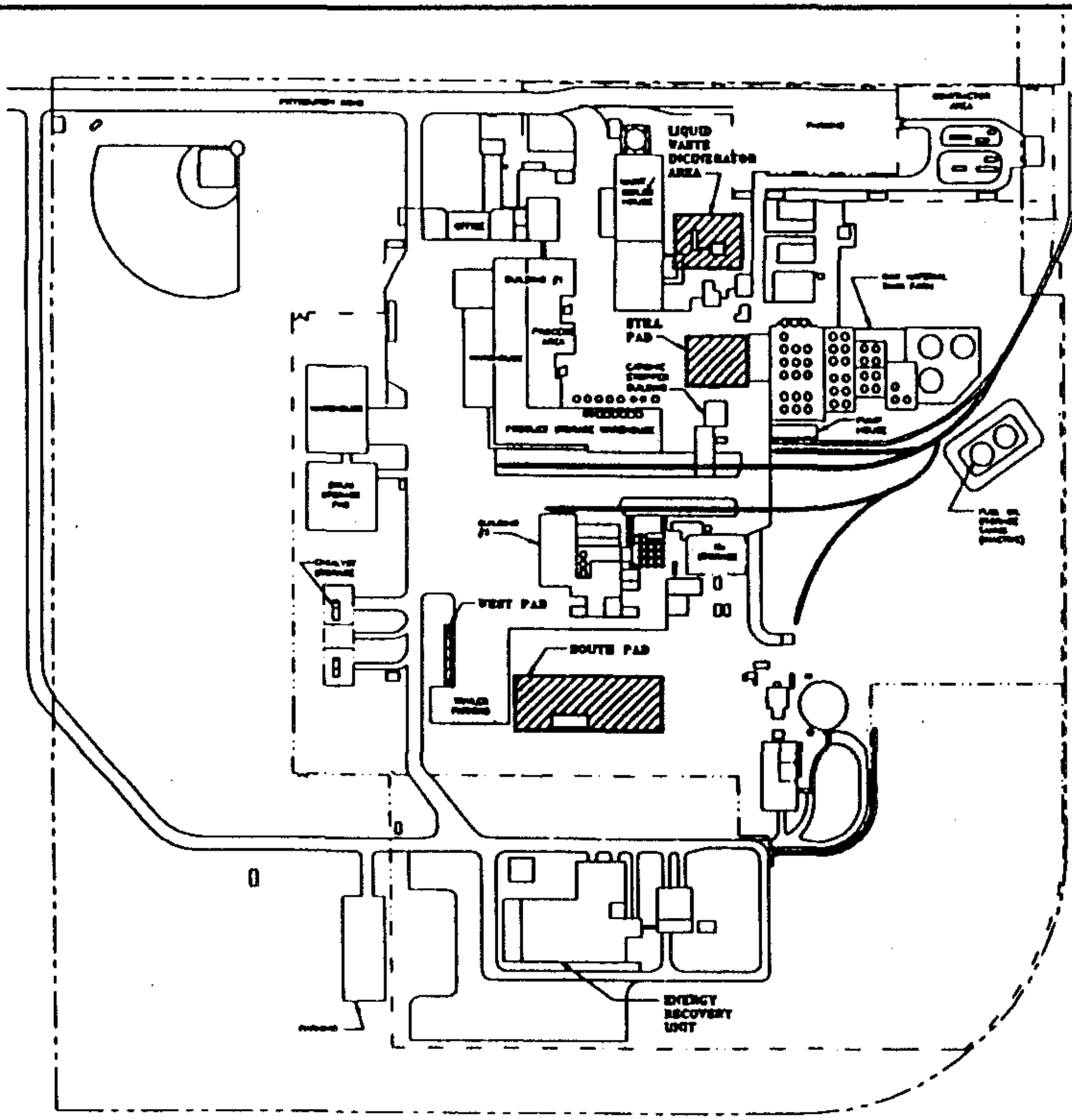
U.S.G.S. 7.5' TOPOGRAPHIC MAP, CIRCLEVILLE, OH
QUADRANGLE DATED: 1961, PHOTOREVISED: 1974

FIGURE 3.1

PPG INDUSTRIES INC. CIRCLEVILLE, OHIO	SITE LOCATION MAP
ICF KAISER ENGINEERS PITTSBURGH, PA.	DATE: AUG. 21, 1992 | DR.: D. BRENT
	SCALE: 1" = 2000' | DWG. NO.: 04830

JOB NO.: 0451200100 PLOT SCALE: 1=1

STARTED ON: 1/6/93 REVISED: 0/00/00



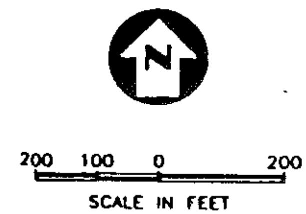


FIGURE 3.2

PPG INDUSTRIES, INC. CIRCLEVILLE, OHIO	PLOT PLAN— INTERIM STATUS HAZARDOUS WASTE MANAGEMENT AREAS
ICF KAISER ENGINEERS PITTSBURGH, PA	DATE: 1/6/93 — DR.: D.MAJERNIK SCALE: AS NOTED — DWG. NO.: FIG3-2

4. DETAILED DRAWINGS OF UNITS TO BE CLOSED

This Section contains the detailed figures of the closed units as specified by OEPA Closure Plan Review Guidance. The figures are labeled as follows:

Figure 4.1 - Liquid Waste Incinerator
Figure 4.2 - Waste Drum Storage - Still Pad
Figure 4.3 - Waste Drum Storage - West Pad
Figure 4.4 - Waste Drum Storage - South Pad

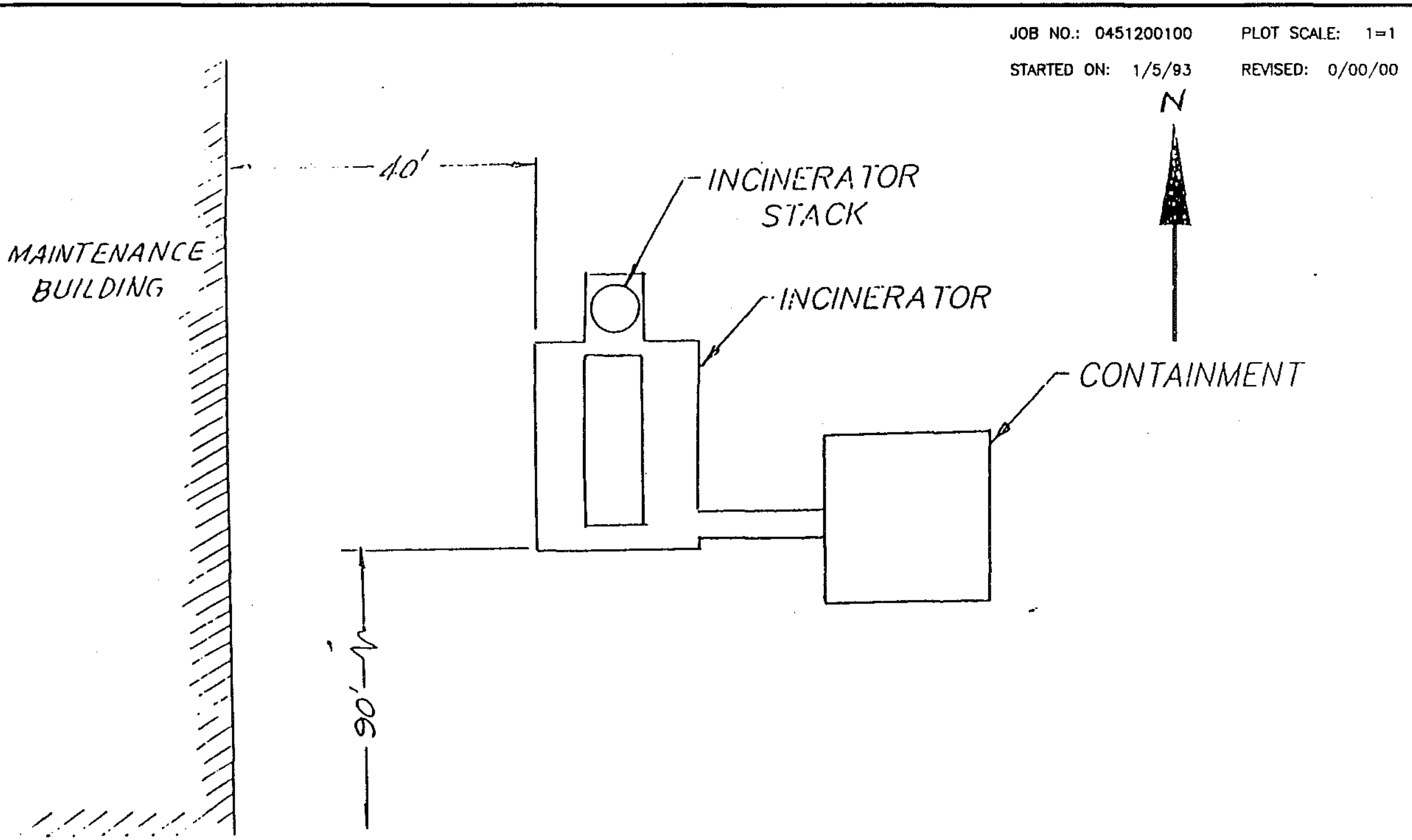


FIGURE 4.1

PPG INDUSTRIES, INC. CIRCLEVILLE, OHIO	FORMER LIQUID WASTE INCINERATOR (TO BE CLOSED)
ICF KAISER ENGINEERS PITTSBURGH, PA	DATE: 1/5/93 — DR.: D.MAJERNIK SCALE: 1"=20' — DWG. NO.: FIG4-1

HAZARDOUS WASTE AREA SPILL CONTAINMENT

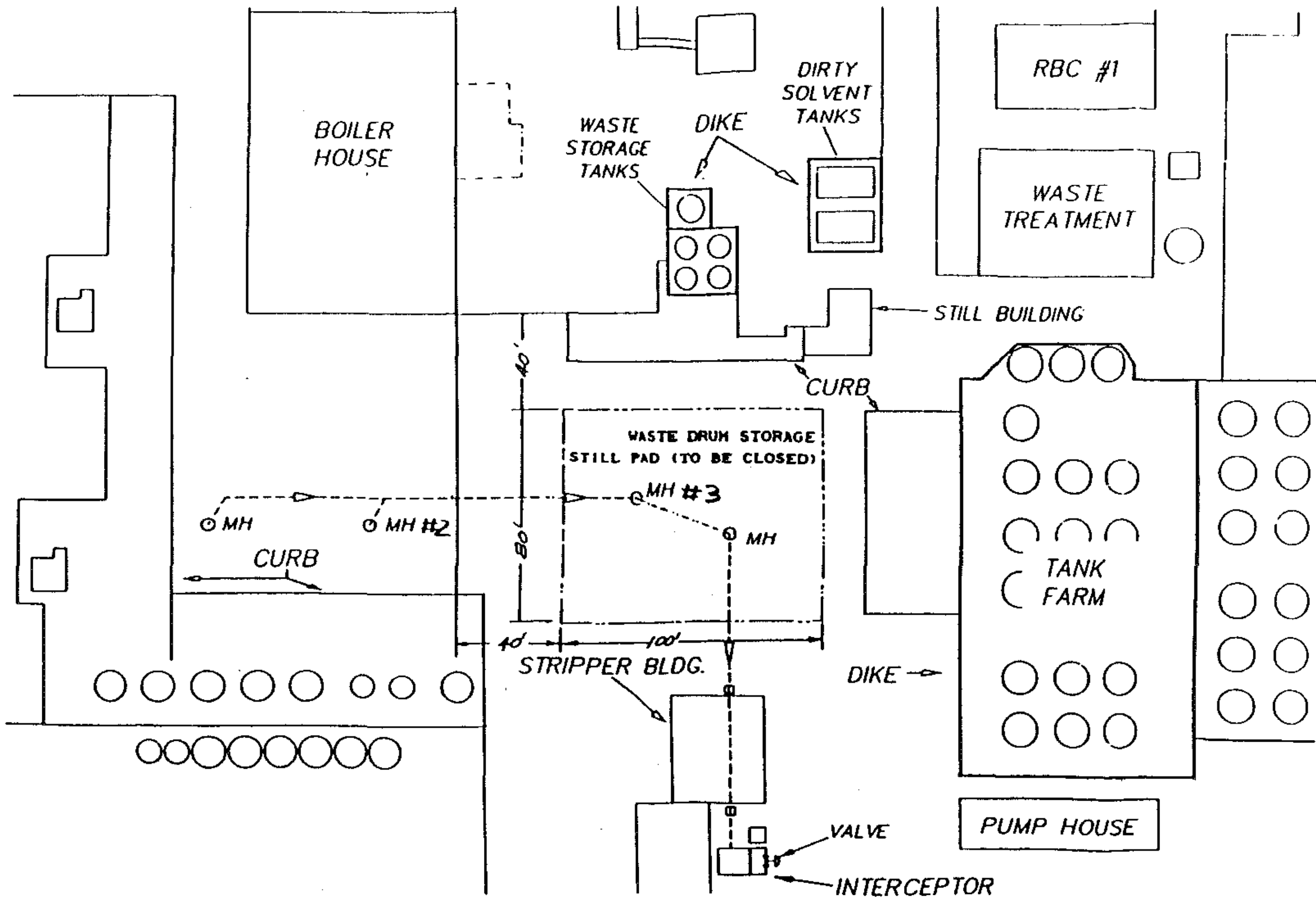


FIGURE 4.2

JOB NO.: 0451200100	PLOT SCALE: 1=1	PPG INDUSTRIES, INC. CIRCLEVILLE, OHIO	WASTE DRUM STORAGE— STILL PAD (TO BE CLOSED)
STARTED ON: 1/6/93	REVISED: 0/00/00	ICF KAISER ENGINEERS PITTSBURGH, PA	DATE: 1/6/93 DR.: D.MAJERNIK SCALE: 1"=40' DWG. NO.: FIG4-2

JOB NO.: 0451200100 PLOT SCALE: 1=1
STARTED ON: 1/6/93 REVISED: 0/00/00

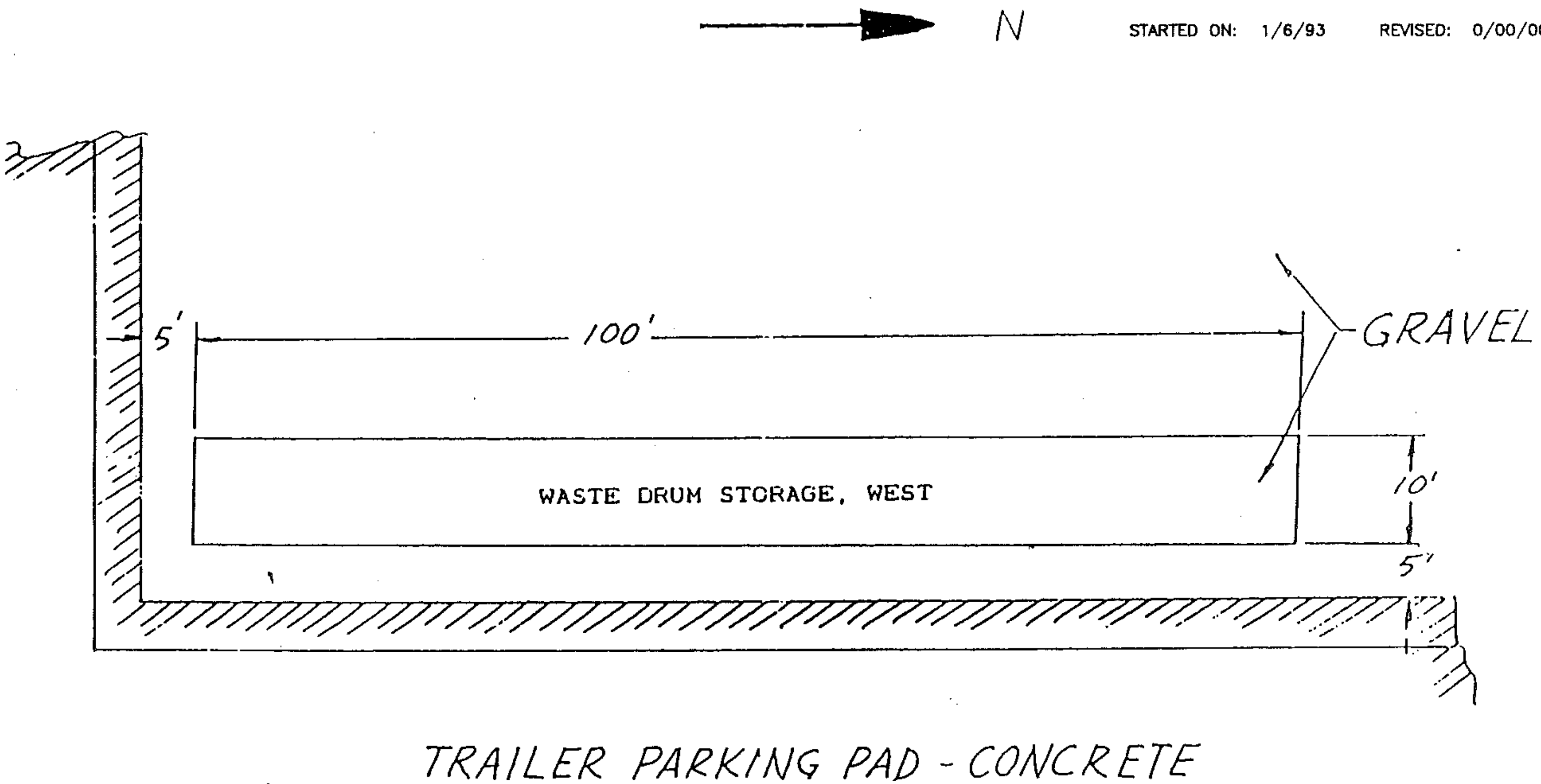


FIGURE 4.3

PPG INDUSTRIES, INC. CIRCLEVILLE, OHIO	WASTE DRUM STORAGE– WEST PAD (TO BE CLOSED)		
ICF KAISER ENGINEERS PITTSBURGH, PA	DATE: 1/6/93	DR.: D.MAJERNIK	
	SCALE: 1"=15'	DWG. NO.: FIG4-3	

JOB NO.: 0451200100 PLOT SCALE: 1=1

STARTED ON: 1/6/93 REVISED: 0/00/00

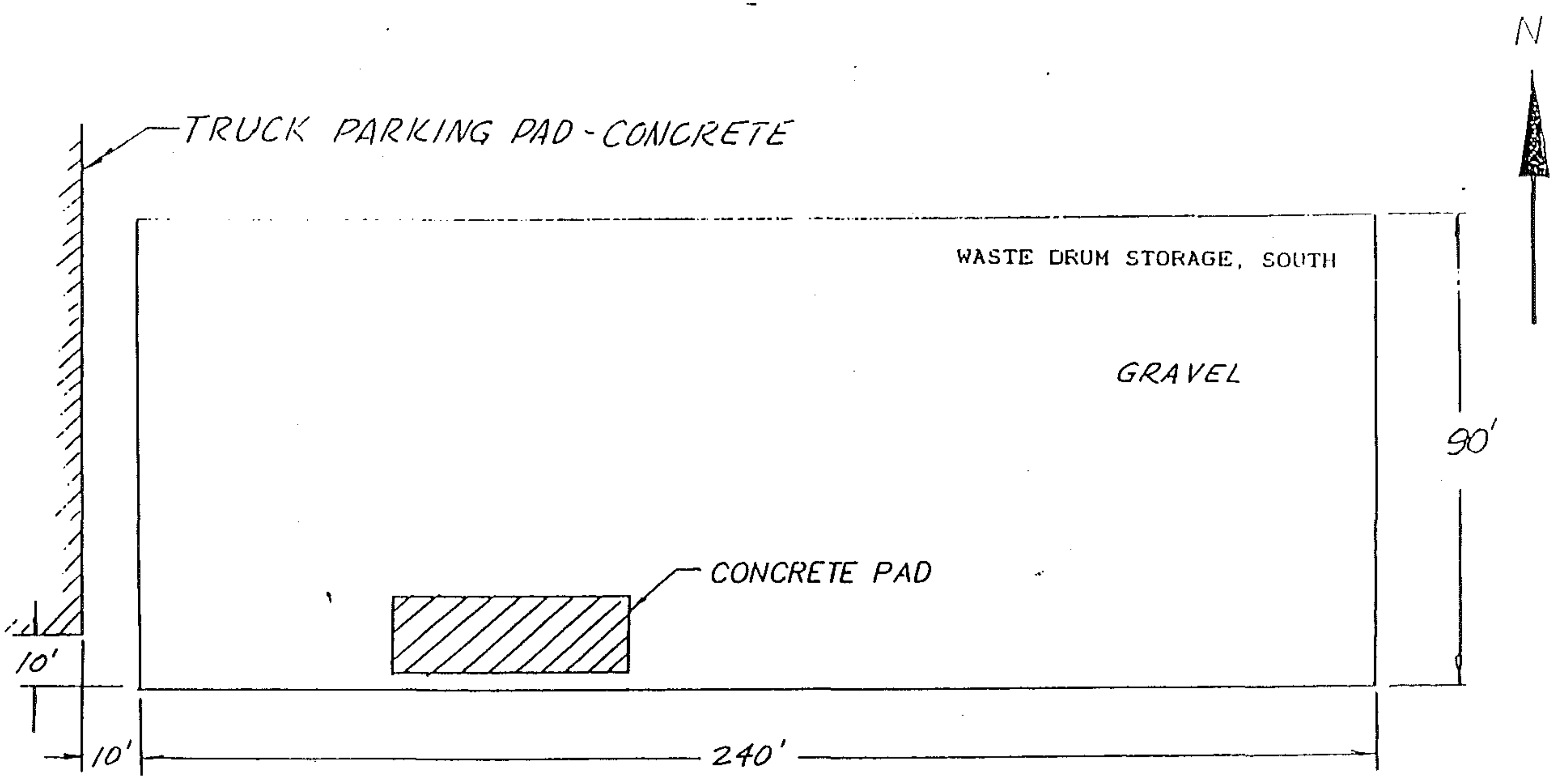


FIGURE 4.4

PPG INDUSTRIES, INC. CIRCLEVILLE, OHIO	WASTE DRUM STORAGE– SOUTH PAD (TO BE CLOSED)	
ICF KAISER ENGINEERS PITTSBURGH, PA	DATE: 1/6/93	DR.: D.MAJERNIK
	SCALE: 1"=30'	DWG. NO.: FIG4-4

5. LIST OF HAZARDOUS WASTES

A complete list of hazardous wastes and Appendix VIII hazardous constituents stored and/or treated at the waste management units closed under this Partial Closure Plan follows. This list also includes an estimate of the maximum inventory of waste in storage or treatment.

5.1 Liquid Waste Incinerator

D001 -	Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methyl isobutyl ketone, methanol, toluene or methyl ethyl ketone)
D001 - D002 D035	Aqueous Decanter Waste (aqueous phase byproduct from resin manufacturing process containing VOCs and organic acids)
F003 -	Still sludge including xylene, ethylbenzene, and methyl isobutyl ketone
F005 -	Still sludge including toluene and methyl ethyl ketone
	Maximum Incinerator Capacity - 5.5 tons/hour

5.2 Waste Drum Storage Area -- Still Pad

D001 -	Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methyl isobutyl ketone, methanol, toluene or methyl ethyl ketone)
F002 -	Spent methylene chloride
F003 -	Incinerator brick and residue generated by the incineration of F003 wastes
F005 -	Incinerator brick and residue generated by the incineration of F005 wastes
U009 -	Waste acrylonitrile
U223 -	Waste toluene diisocyanate
	Drums containing lab packs
	Maximum Inventory - 1000 drums

5.3 Waste Drums Storage Area -- West Pad

D001 - Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methyl isobutyl ketone, methanol, toluene or methyl ethyl ketone)

F002 Spent Methylene Chloride

Maximum Inventory - 200 drums

5.4 Waste Drum Storage -- South Pad

D001 - Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methyl isobutyl ketone, methanol, toluene or methyl ethyl ketone)

Maximum Inventory - 1500 drums

The previous Partial Closure Plan submitted to OEPA included methanol as a component of the F003 waste listing. However, the methanol managed at the facility was only associated with the Waste Resin Material (D001).

6. SCHEDULE FOR CLOSURE

Partial closure of the interim status hazardous waste management units at the site consisted of the following:

- Decontamination of Liquid Waste Incinerator equipment.
- Decontamination of the Still Pad concrete.
- Rinseate sampling and analysis to confirm successful decontamination of the incinerator equipment and Still Pad concrete, and to determine rinseate disposal requirements.
- Disposal of incinerator equipment.
- Removal and disposal of various concrete pads.
- Soil sampling and analysis to confirm that the remaining soils in the areas of the waste management units meet clean closure requirements.

Figure 6.1 shows the schedule in bar chart form, indicating the field activities that were performed during the time period April 1989 through November 1989. Since November of 1989, the following significant activities have occurred as the result of the continuing dialogue between PPG and Ohio EPA:

Date	Activity
05/11/90	PPG submits revised Partial Closure Plan.
07/25/90	Attorney General's office responds to resubmitted Plan. OEPA wants the Partial Closure Plan to reflect the work that has already been complete and for PPG to decide whether each unit will be clean closed or closed based on a risk assessment demonstration of clean closure.
01/14/91	PPG submits revised Partial Closure Plan that includes work completed to date and a risk assessment demonstration for clean closure of the South Drum Storage Pad, West Drum Storage Pad, and Former Liquid Incinerator area.
05/01/91	OEPA issues new closure guidance document.
06/28/91	OEPA provides comments on January 1991 Partial Closure Plan.
09/13/91	PPG submits response to OEPA issues raised in June 28, 1991 letter.

11/22/91	OEPA responds to 9/13/91 submittal by PPG.
11/26/91	PPG meets with OEPA to discuss each point in OEPA's November 22, 1991 letter.
01/03/92	Letter dated December 31, 1991 from OEPA which summarizes the status of negotiations based on the 11/26/91 meeting is transmitted to PPG. This OEPA letter summarized issues yet to be resolved.
04/14/92	PPG provides written response to OEPA's letter of 12/31/91. PPG's response includes documentation that PCB levels in the sampling results are unrelated to RCRA activities and that no additional sampling is necessary to define the extent of past releases.
05/08/92	Representatives of OEPA visit plant to look at areas covered by the Partial Closure Plan.
06/01/92	OEPA comments in writing on PPG's response of 4/14/92. OEPA accepts PPG's documentation that PCBs found as a result of closure sampling activities are unrelated to RCRA activities. OEPA requires that the full extent of contamination must be defined.
07/27/92	PPG responds in writing to OEPA's letter of 6/1/92. PPG proposes to perform additional soil sampling to move negotiations forward.
08/04/92	OEPA conducts site visit of plant.
08/07/92	PPG responds in writing to OEPA's site visit and proposes to take an additional sample from the former liquid incinerator area.
08/31/92	OEPA accepts the additional sampling proposed in PPG's letters of 7/27/92 and 8/7/92.
09/23/92	ICF Kaiser Engineers conducts additional sampling.
10/07/92	
10/13/92	Hearing date is set for February 8, 1993.

10/31/92	ICF Kaiser Engineers re-samples grids where samples from 9/23/92 exceeded their holding time for analysis.
12/11/92	PPG submits results of additional sampling program to OEPA.
01/08/93	PPG submits revised Partial Closure Plan to reflect all resolved issues.
01/19/93	OEPA Central Office comments on the revised Partial Closure Plan dated January 7, 1993.
01/21/93	OEPA Central District Office comments on the revised Partial Closure Plan dated January 7, 1993.
01/29/93	PPG responds in writing to OEPA's comments of 1/19/93 and 1/21/93.
02/02/93	Hearing Examiner, counsel for PPG, and counsel for OEPA staff participate in a telephone conference call in which counsel represented that the parties had reached a settlement agreement. Additional time was requested to prepare a settlement agreement.
02/05/93	Attorney General's office responds to PPG response of 1/29/93. OEPA accepts PPG responses and requires that the Partial Closure Plan address all necessary sampling to define the vertical extent of contamiantion or provide for amending the Closure Plan to address closure in place.
02/08/93	Hearing Examiner orders filing of Settlement Agreement on or before March 1, 1993.
02/19/93	PPG submits revised Partial Closure Plan to incorporate comments in the letter dated 2/5/93 from the Attorney General's office.
03/08/93	Settlement agreement reached between PPG and OEPA.
03/08/93	Revised Partial Closure Plan made available for public comment through 04/14/93

03/24/93	ICF Kaiser Engineers performs additional soil sampling to define vertical extent of contamination and to determine leaching potential of constituents to groundwater using TCLP procedure.
04/02/93	PPG submits letter to OEPA correcting Grid Number 71 to 76.
05/05/93	Hearing Examiner issues Report and Recommendations.
06/11/93	OEPA Director issues letter approving amended Closure Plan to PPG (Received 6/14/93).

The only remaining schedule item is final certification by an independent registered Professional Engineer and PPG which will perform after acceptance of this revised plan by the Agency.

JOB NO.: 0451200100 PLOT SCALE: 1=1

STARTED ON: 1/5/93 REVISED: 0/00/00

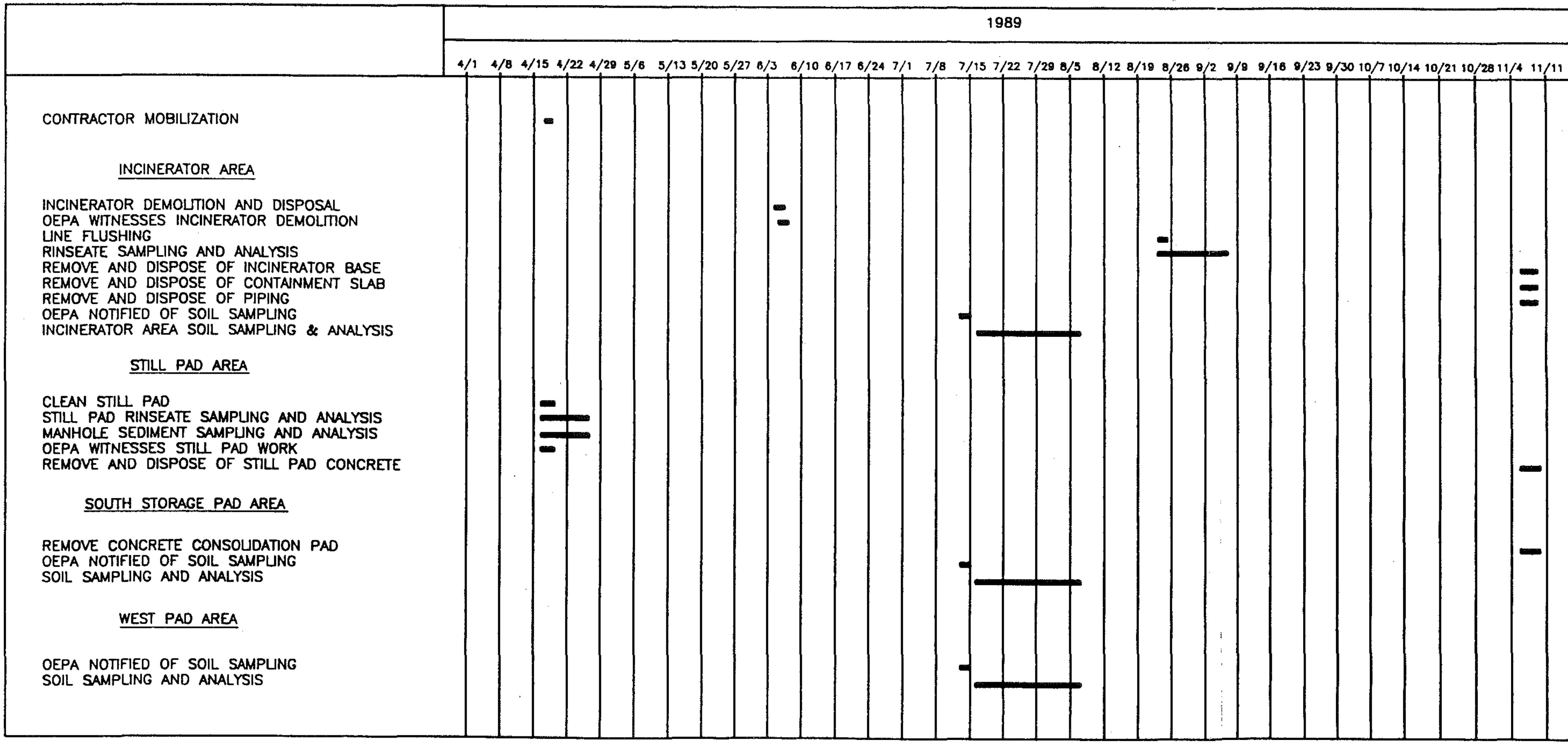


FIGURE 6.1

PPG INDUSTRIES, INC. CIRCLEVILLE, OHIO	PROJECT SCHEDULE 1989 PARTIAL CLOSURE ACTIVITIES	
ICF KAISER ENGINEERS PITTSBURGH, PA	DATE: 1/5/93 SCALE: NONE	DR.: D.MAJERNIK DWG. NO. TIMELINE.DWG

7. AIR EMISSIONS

Appropriate engineering controls were used during the partial closure activities to minimize odors and dust emissions. Water spray was used as necessary to control fugitive dust emissions during incinerator decommissioning. Overspray from high pressure washing of the Still Pad was controlled by carefully directing the spray towards the center of the containment area and by plastic wrapped plywood barriers when working near the pad edges.

8. PERSONNEL SAFETY AND FIRE PREVENTION

All_Partial Closure Work was performed in Level D protection. The personnel protective equipment consisted of coveralls, gloves, steel-toed boots, eye protection and hard hats. This level of protection provided adequate dermal and respiratory protection from the substances present in the closure areas and the work activities performed. Dust respirators (Level C respiratory protection) were used whenever personnel entered the incinerator or whenever conditions required them.

PPG plant safety rules were followed by clean-up and sampling personnel at all times during closure activities. These rules are attached as Attachment D. These safety rules address possible hazards to workers present at the plant, and describe specific fire prevention measures. Areas undergoing closure were isolated with yellow caution tape to limit access.

To prevent the spread of contamination during the 1989 closure activities, the following procedures were followed:

Prior to leaving the decontamination area, the coveralls were removed and discarded; residues from the boots or other outer protective clothing were scraped or rinsed. Personnel undergoing decontamination stood in containment areas to catch all rinseate and residues resulting from decontamination activities.

9. DECONTAMINATION EFFORTS

An independent registered Professional Engineer has certified that appropriate methods were used and that a minimum amount of residue remains based on the activities performed in 1989. The risk assessment as described in Section 10 of this Closure Plan confirms that the remaining residues do not present an unacceptable risk to human health. The results of analytical tests on the rinseates generated during decontamination efforts are included in Attachments A and B. Attachment A includes the results of all analyses performed during the closure under the direction of the independent registered Professional Engineer. Attachment B summarizes only the detected compounds. Additional soil sampling performed in 1992 at three of the interim status hazardous waste management units is described in Section 11.0 and the results included in Attachment C. Minor sampling was conducted in March, 1993 to define the vertical extent of contamination at two of the units. Samples were also collected during this event to determine the leachability of constituents of concern from soil to groundwater.

9.1 Incinerator

After shutdown and cooldown, all residue in the incinerator hearth, breech and stack were removed and put into drums. It was evident that decontamination was not feasible, due to difficulty in removing refractory material from metal parts. The incinerator hearth, breeching, stack, refractory, and ancillary equipment were dismantled and loaded into roll-off boxes or dump trailers and transported to Adams Center Landfill, a RCRA permitted secure landfill, located in Fort Wayne, Indiana. TCLP analyses for F003-F005 spent solvent wastes were performed to ensure compliance with land ban disposal restrictions. The results of this analysis are also included in Attachment B.

9.2 Incinerator Organic Waste Feed Lines

There were two (2) organic waste feed lines, each of which was approximately 120 feet long and 1-1/2 inches in diameter.

These lines were cleaned of organic residue by repeatedly flushing them with fifty gallons of cleaning solvent (the same solvent used by PPG to clean production equipment). The cleaning solvent was analyzed for percent total solids before and after each flush. When the "before" and "after" percent solids analysis of the cleaning solvent were within 0.5 percent of each other, solvent cleaning ceased. The spent solvent was sent to the on-site permitted hazardous waste incineration facility (ERU).

Following the solvent cleaning the lines were flushed three times with water to remove residual solvent. This water also was sent to the ERU. Detectable concentrations of solvents remained in the rinseate. It was decided to treat the pipe as a hazardous waste rather than attempt further decontamination.

The cleaned pipe was then taken down, cut into sections, and visually inspected for hardened residues. No residue was visible. The pipes were disposed of as a hazardous waste in the Adams Center Landfill.

9.3 Incinerator Aqueous Waste Feed Line

The aqueous waste feed line was about 100 feet long and one (1) inch in diameter.

The aqueous waste feed line was flushed three times with deionized water. The flushing water was sent to the ERU. Detectable concentrations of solvents remained in the rinseate. It was decided to treat the feed line as a hazardous waste rather than attempt further decontamination.

Once cleaned, the line was taken down, cut into sections, and inspected. No residue was visible. The pipes were disposed of as a hazardous waste in the Adams Center Landfill.

9.4 Incinerator Base, Spill Containment Pad and Drum Storage Pad (Still Pad)

After the incinerator equipment and residues were placed in secure containers as previously described, the incinerator base, spill containment pad and adjacent drum storage area were swept to remove any loose debris.

These areas then were scraped to remove any visible residues. All residues removed from the concrete surface were placed into DOT-approved 17-H drums.

No further cleaning was performed on the incinerator base and containment pad. These were removed and disposed of as a hazardous waste in the Adams Center Landfill. Although this material may have been considered "non-hazardous" under 40 CFR Part 261, it was disposed of as a hazardous waste.

The Still Pad was decontaminated with high pressure water. Rinseate was contained inside a foam dike which was installed at the perimeter. The dike material was used to provide a leak-proof containment area. During cleaning operations, all rinseate was collected using drum vacuums. The recovered water was transferred to DOT-approved 17-E drums. The final rinse was collected, placed into drums, and a composite sample collected using glass coliwassa tubes. The rinseate was analyzed for the entire Hazardous Substance List including the following F002, F003, and F005 substances:

Xylene
Ethylbenzene
Methyl Isobutyl Ketone
Methanol
Toluene
Methyl Ethyl Ketone
Methylene Chloride

The rinseate samples from this area were also analyzed for PCBs (polychlorinated biphenyls) and acrylonitrile. Toluene diisocyanate, also stored here, was not included in this analysis. This substance is reactive with water and cannot be quantified by standard analytical methods.

Of the above substances, only methylene chloride was found above detectable limits (169 parts per billion) in the final rinseate. Since no MCL or MCLG exists for methylene chloride, 1 mg/L is the clean standard for the rinseate. A library search for tentatively identified compounds also detected 84.1 mg/L of Butyl Cellosolve. This contaminant was most likely a result of using reconditioned 17-E Drums for rinseate collection. However, this compound is not a hazardous constituent as defined in 40 CFR Part 261. On this basis, the Still Pad was considered clean. All rinseate and foam dike material was incinerated on-site at the ERU.

As described in Section 12, the Still Pad was removed as part of PPG's East Yard PCB Remediation and Spill Containment Project. All concrete within the Still Pad area was removed and disposed of as a hazardous waste at the Adams Center Landfill. TCLP analyses for F003-F005 spent solvent wastes were performed to ensure compliance with land ban disposal restrictions. The results of these analyses are included in Attachment B. Although this material may have been considered "non-hazardous" under 40 CFR Part 261, it was disposed of as a hazardous waste.

10. CLEAN LEVELS FOR SOILS

10.1 Introduction

In order to demonstrate the clean closure of the Former Liquid Waste Incinerator, West Drum Storage Pad and the South Drum Storage Pad, a risk assessment was performed to determine whether or not a threat to human health exists in association with the residual chemicals originating in these three units. The risk assessment was conducted in accordance with the approaches and design required by OEPA's "Closure Plan Guidance Manual" (1991; with errata sheets), despite the fact that these approaches do not reflect anticipated site situations. This section is a brief summary of the supporting risk assessment for this partial closure. Details of the information presented here may be found in the risk assessment document included as Attachment E.

10.2 Background

The risk assessment was conducted in a manner consistent with the original National Academy of Sciences approach (1983), which recommends the four steps as follows: hazard identification (identification of chemicals of concern), which includes organization of unit investigation data and identification of chemicals of concern; dose-response assessment (toxicity assessment), which involves the determination of the relation between the magnitude of exposure (dose) and the probability of occurrence (response) of adverse health effects associated with the chemicals of concern; exposure assessment, which consists of identification of the receptors likely to be exposed to the chemicals and the extent of their exposure under defined exposure scenarios; and risk characterization, which is a description of the nature and the magnitude of non-cancer health risk and theoretical excess lifetime cancer risks, including attendant uncertainty, comparisons to typical risks encountered from other sources, and evaluation of the necessity for remedial action. Each step is addressed in greater detail below.

10.3 Chemical Selection

OEPA requires that every chemical attributable to and detected in each unit be incorporated into the risk assessment. In addition, the highest concentration of each detected chemical must also be included in the risk assessment for each unit. The applicable detected chemicals for each unit are presented in Table 10.1. These chemicals and the maximum concentrations were incorporated into the subsequent steps of the risk assessment.

10.4 PCB Exclusion

Polychlorinated biphenyls (PCBs) were detected in some of the soil samples collected from beneath the South Pad and Former Liquid Waste Incinerator areas; however, the presence of PCBs in these areas is not related to RCRA waste management activities and thus, PCBs were not included in the list of compounds addressed by the risk assessment. Attachment F presents PPG's documentation and certification that PCB levels recorded were not related to RCRA activities. This documentation was previously submitted to OEPA on April 14, 1992 and accepted by OEPA in their letter dated June 1, 1992.

Extensive PCB remediation has been conducted at the site by PPG. This remediation began in April of 1988 as a result of finding PCB contamination in the plant storm sewers. The source of this contamination was the hot oil Therminol System. Remediation followed the guidelines of the PCB Spill Cleanup Policy and applicable TSCA (Toxic Substances Control Act) requirements. The "action" level for soils tested as part of this remediation is 25 ppm as set forth in the cleanup policy for restricted area locations.

The storm sewer, including manholes in the Still Pad area, were included in the Phase III East Yard remediation project. Compounds present in the two open manholes in the Still Pad Area were clearly from sources other than the waste stored on the Still Pad Area. During remediation of the East Yard Area, PCB and VOC analysis were completed upstream, e.g., Manhole #2, of the Still Pad and showed elevated levels of PCBs and VOCs. Considering the source of PCB's (Therminol pump area) and VOC's (bulk product loading) it is clear these compounds were not related to hazardous waste storage at the Still Pad. These manholes were completely removed and replaced along with the rest of the contaminated storm sewers. All surface concrete in the East Yard area was also removed and replaced. A final report detailing remediation activities and sampling was submitted to OEPA in February 1990 and titled "East Yard Remediation, PPG Industries, February 1990, Project Number 88727". This contamination was and is being addressed by the Administrative Order of Consent signed between PPG and OEPA dated December 1989.

10.5 Dose-Response Assessment

To identify dose standards (benchmark values) for each of these chemicals, the USEPA Health Effects Summary Tables (HEAST) and Integrated Risk Information System (IRIS) were accessed and the information was incorporated into the risk assessment. Table 10.2 presents the benchmark values for each chemical of concern.

10.6 Exposure Assessment

OEPA requires a future unrestricted land use scenario for RCRA closure risk assessments. This scenario was incorporated into this risk assessment, for both an adult and a child, using factors as required in the OEPA "Closure Plan Guidance Manual". The exposure pathways required by OEPA were evaluated quantitatively, as follows: ingestion of chemicals in soil, dermal contact with chemicals in soil, inhalation of chemicals associated with unit-originated airborne particulate matter, ingestion of chemicals in water, inhalation of chemicals volatilizing during showering, dermal contact with chemicals in water, and inhalation of chemical volatilizing from soil. Where specific approaches were not identified by OEPA, appropriate calculations were incorporated, complete with explanations of factors, equations and full literature citations.

To document that there is no potential for constituent migration to groundwater, a total of four soil samples were collected at a depth of 6"-12" below ground surface at Grid Location Numbers 24 and 45 at the Former Liquid Waste Incinerator and Grid Location Numbers 76 and 100 at the South Drum Storage Area and subjected to the TCLP leaching procedure. TCLP leachates produced were analyzed for volatile organic constituents of concern (ethylbenzene, toluene, xylene and methylene chloride) using EPA SW 846 Method 8240. None of these constituents were detected in the TCLP samples; therefore, groundwater exposure pathways do not require consideration in the risk assessment.

10.7 Risk Characterization

The results of the risk assessment are presented in the risk characterization section of Attachment E. Noncancer hazard indices, summed for all chemicals and all exposure pathways, and theoretical excess lifetime cancer risks, summed for all chemicals and all pathways in each unit are presented here. OEPA requires that summed non-cancer hazard values be less than one, and that summed theoretical excess lifetime cancer risks be less than one in one million, or 1×10^{-6}. The data indicate that these values are within the acceptable limits for each unit. These data are presented in Table 10-3.

10.8 Uncertainty Analysis

The uncertainty analysis section of Attachment E qualitatively describes the likelihood that the approaches incorporated into this assessment result in underestimates or overestimates of the risk conclusions. Regulatory risk assessment in general, as it is currently practiced, is highly conservative and often focused on an absolute worst case scenario. The Closure Plan Guidance required by OEPA extends beyond that recommended even by the USEPA in the "Risk Assessment Guidance for Superfund" and implements approaches which would not be reproducible in an actual situation.

Thus, the risks documented in this report are far in excess of those which would be anticipated to actually occur. Details on the basis for these conclusions are presented in the risk assessment document.

10.9 Conclusion

The results for the three units, the Former Incinerator, the South Pad and the West Pad, incorporating the selection of chemicals of concern, exposure assessment, dose-response assessment, and risk characterization approaches required by OEPA for RCRA closure, indicate that noncancer hazards and theoretical excess lifetime cancer risks are within the limits established in the Closure Plan Review Guidance Manual by the OEPA (1991). No subsequent evaluation or post-closure monitoring is recommended.

TABLE 10-1

CHEMICALS OF CONCERN

Area Description	Chemicals of Concern
Incinerator Area	Xylene Ethylbenzene Methylene Chloride
South Pad	Xylene Ethylbenzene Methylisobutyl Ketone (MIBK) Toluene Methylene Chloride
West Pad	Xylene Ethylbenzene Methanol Toluene

TABLE 10-2

BENCHMARK VALUES FOR CHEMICALS OF CONCERN

Chemical	Oral Reference Dose (RfD)	Inhalation Reference Dose	Oral Slope Factor	Inhalation Slope Factor
	(mg/kg-day)	(mg/kg-day)	$(mg/kg\text{-}day)^{-1}$	$(mg/kg\text{-}day)^{-1}$
Xylene	2.0 E+0	2.0 E+0[1]	NA[2]	NA
Ethylbenzene	1.0 E-1	2.9 E-1	NA	NA
MIBK	5.0 E-2	2.0 E-2	NA	NA
Methanol	5.0 E-1	5.0 E-1	NA	NA
Toluene	2.0 E-1	1.1 E-1	NA	NA
Methylene Chloride	6.0 E-2	8.6 E-1	7.5 E-3	1.6 E-3

[1] In absence of inhalation reference dose, the oral reference dose was used.

[2] NA - Not Applicable; Chemical not considered to be a potential carcinogen by the USEPA.

References:

U.S. EPA, 1992a. IRIS (Integrated Risk Information System). U.S. Environmental Protection Agency, Washington, D.C.

U. S. EPA, 1992b. Health Effects Assessment Summary Tables, (HEAST, 1992).

U.S. EPA, 1991. Health Effects Assessment Summary Tables, (HEAST, 1991).

TABLE 10-3

SUMMARY TABLE FOR COMBINED HAZARD INDICES
AND THEORETICAL EXCESS LIFETIME CANCER RISKS

Receptor/Area	Combined Hazard Index	Theoretical Excess Lifetime Cancer Risks
Adult/Incinerator Area	6.20 E-03	8.83 E-07
Child/Incinerator Area	1.30 E-02	3.69 E-07
Adult/South Pad	1.42 E-02	6.62 E-07
Child/South Pad	3.19 E-02	2.77 E-07
Adult/West Pad	8.57 E-04	NA
Child/West Pad	1.92 E-03	NA

NA - No putative carcinogenic chemicals detected in this area

11. SOIL SAMPLING AND ANALYSIS

Sampling methods and equipment, as well as laboratory analytical methods, followed U.S. EPA's publication, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846). Sampling was performed by independent contractors, and the analysis was performed by an outside laboratory with an approved QA/QC plan for each parameter of interest. A copy of the laboratory's QA/QC qualifications was submitted to PPG. Actual QA/QC analysis is included in the analytical reports or available from the laboratory.

A summary of all 1989 soil sampling analytical results is included in Attachments A and B. Attachment A includes the results of all analyses performed during the Partial Closure activities under the direction of the independent registered Professional Engineer. Attachment B summarizes only the detected compounds.

In September 1992, PPG conducted additional sampling at the South Pad, West Pad and Former Liquid Waste Incinerator as agreed to in PPG's letters to OEPA dated July 27, 1992 and August 7, 1992. Results of this additional sampling effort are summarized in the Closure Plan Addendum presented in Attachment C. This addendum was submitted separately to OEPA on December 11, 1992. On March 24, 1993 additional minor sampling was conducted to determine the vertical extent of methylene chloride contamination at the Former Liquid Waste Incinerator and South Pad Drum Storage Areas. Samples were also collected to determine the leachability of constituents of concern from soil to groundwater using the TCLP procedure. The results of this sampling were submitted to OEPA separately in a letter dated June 25, 1993.

The following Sections 11.1 through 11.4 summarize the soil sampling activities and results from the Partial Closure Activities performed in 1989. Attachment C describes the 1992 additional soil sampling program.

The results of these sampling efforts have established that no constituents of concern occur at unacceptable risk levels. Detectable concentrations of methylene chloride were identified in 12"-24" samples from two locations at the Former Liquid Waste Incinerator (Grids 24 and 45) and one location at the South Drum Storage Area (Grid 100). To further define the occurrence of methylene chloride at depths below the 24" level from the units being closed, PPG collected samples from these locations at depths of 24"-36", 36"-48" and 48"-60". The samples collected were analyzed, along with appropriate QA/QC samples, for methylene chloride using EPA SW-846 method 8240. Methylene chloride was not detected in any of these samples; therefore the vertical extent of methylene chloride contaminant has been fully defined.

11.1 Incinerator Area

The soil around the Former Liquid Waste Incinerator was tested in 1989 for constituents listed below at points designated by the hatched areas of the Sampling Grid as shown in Figure 11.1. The representative sample points noted on all Sampling Grids in this Plan (Figures 11.1, 11.2 and 11.3) were developed using SW-846 protocol and a random number generator. If two points were adjacent, the next number was used. If concrete or a structure interfered with the sample location, the grid next to the location was used. Samples were collected according to EPA soil sampling and chain-of-custody protocol and analyzed using EPA SW-846 methods. A power auger was used to remove the top four to six inches. The loose soil was removed and a grab sample collected using a tongue depressor where necessary to loosen the soil. The samples were placed in clean glass 40 milliliter (ml) vials with Teflon septa.

The soil samples were analyzed for the complete Hazardous Substance List (HSL) volatiles according to SW-846 Method 8240. In addition, methanol, n-butanol and isobutanol were analyzed according to SW-846 Methods 5030 and 8015.

One composite soil sample made up of all eighteen soil samples from the area was analyzed for all dioxins and furans according to SW-846 Method 8280, including 2,3,7,8- TCDD (polychlorinated dibenzo dioxin), 2,3,7,8-TCDF (polychlorinated dibenzo furan), and PCBs (Polychlorinated Biphenyls) according to SW-846 Method 8080. Ignitability was not checked because there is no approved method of testing flashpoint of solids. The samples were not analyzed for heavy metals because metals were not used in manufacturing processes at the facility where the waste was generated.

It is unlikely that spills occurred in the incinerator area because of the closed piping system. The most likely source of leakage, if it occurred, would have been at the connection to the incinerator. No contaminated runoff occurred to the best of PPG's knowledge because of the containment pad around the incinerator. Samples were taken in the areas designated in Figure 11.1.

The results of the sampling are summarized in Attachments A, B and C. Analysis of samples collected from Grid Locations 24 and 45 on March 24, 1993 have defined the extent of vertical contamination, therefore, the Incinerator Area can be considered clean closed.

11.2 Still Pad

Sediment grab samples were obtained in 1989 from the bottom of the two grated cover manholes in this area. The sediment samples were analyzed for the complete Hazardous Substance List (HSL) volatiles according to SW-846 Method 8240. In addition; methanol, butanol, isobutanol, and butyl cellosolve were quantified according to SW-846 Methods 5030 and 8015. These samples also were analyzed for PCBs according to SW-846 Method 8080.

Still Pad decontamination rinseate sample results were below standards identified in OEPA's Closure Plan Review Guidance. Documentation exists to conclude that the presence of constituents of concern in subsurface soils are not related to RCRA management activities at the Still Pad. During Phase III of PPG's PCB remediation project, the Still Pad as well as contaminated storm sewers and manholes and the surface concrete in the Plant's East Yard were removed and replaced. A summary of analytical results from post remediation sampling is included in Table 11.1. To clarify the data presented in Table 11.1, Manhole #3 was within the area of the Still Pad and Manhole #2 was upgradient in the storm sewer system and closer to the source of VOC contamination (bulk product loading). A sketch of this portion of the East Yard showing the Still Pad and the location of the manholes and storm sewers is included in Figure 4.2. The Still Pad is considered cleaned closed and no further action is necessary.

11.3 South Drum Storage Area

Soil samples were taken in 1989 at points indicated by the hatched areas on the sampling grid shown in Figure 11.2, using methods previously described under Section 11.1. Analyses for HSL volatiles organics and alcohols were performed as described in Section 11.1.

Two composite soil samples made up of all 48 soil samples from the area were analyzed for PCBs according to SW-846 Method 8080. Soil was not tested for ignitability or heavy metals for the reasons described in Section 11.1.

The results of the sampling are summarized in Attachments A, B, and C. Analysis of samples collected from Grid Location 100 has defined the extent of vertical contamination; therefore, the South Pad Drum Storage Area can be considered clean closed.

11.4 West Drum Storage Pad

Soil samples were taken in 1989 at points indicated by the hatched areas on the sampling grid shown in Figure 11.3, using the methods previously described under Section 11.1. Analyses for HSL volatile organics and alcohols were performed as described in Section 11.1.

One composite soil sample made up of all nine soil samples from the area was analyzed for PCBs according to SW-846 Method 8080. Soil was not tested for ignitability or heavy metals for the reasons described in Section 11.1.

The results of the sampling are summarized in Attachments A, B and C. Since no constituents were detected at unacceptable risk levels, the West Pad is considered clean closed, and no further action is required.

TABLE 11.1

EAST YARD POT-REMEDIATION SAMPLING RESULTS
VOC AND PCB ANALYSIS
All Results in μg/kg

Volatiles	Manhole #2 Area	Manhole #3 Area	
	CV-89-0691	CV-89-0688	CV-89-0689
2-Butanone	920 J	490 J	800 J
Toluene	2100	580 U	800 U
Ethylbenzene	51000	2500	7000
Xylene	330000	24000	21000
4-methyl-2-pentanone	3700 U	1200 U	1600 U
PCB (A-1248)	2,100,000/1,500,000	590 U	3500

Letters refer to standard CLP qualifiers.

Note: Manhole #2 is located upgradient of the Still Pad.
Manhole #3 was within the area of the Still Pad.

JOB NO.: 0451200100 PLOT SCALE: 1=1

STARTED ON: 1/5/93 REVISED: 0/00/00

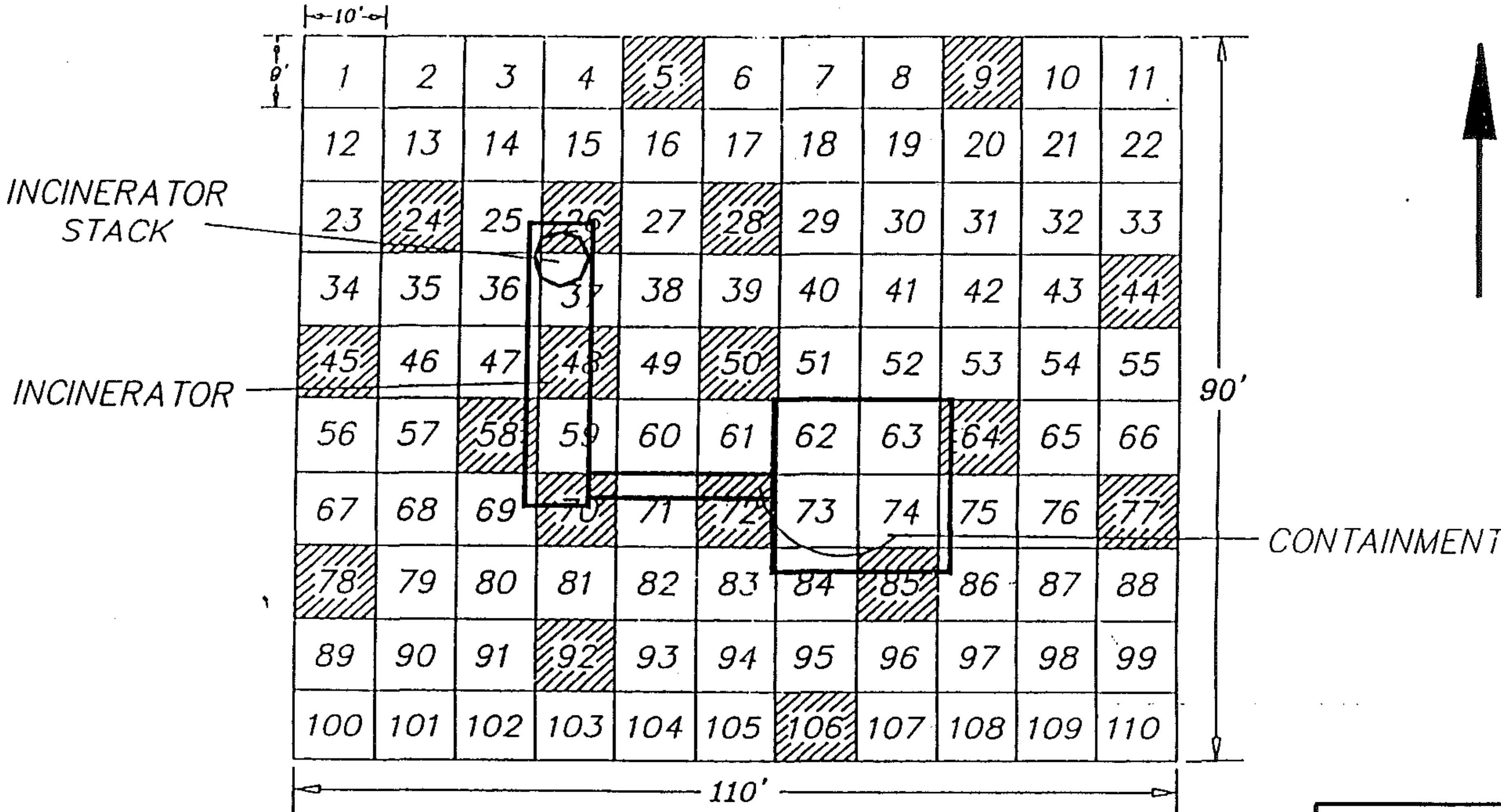
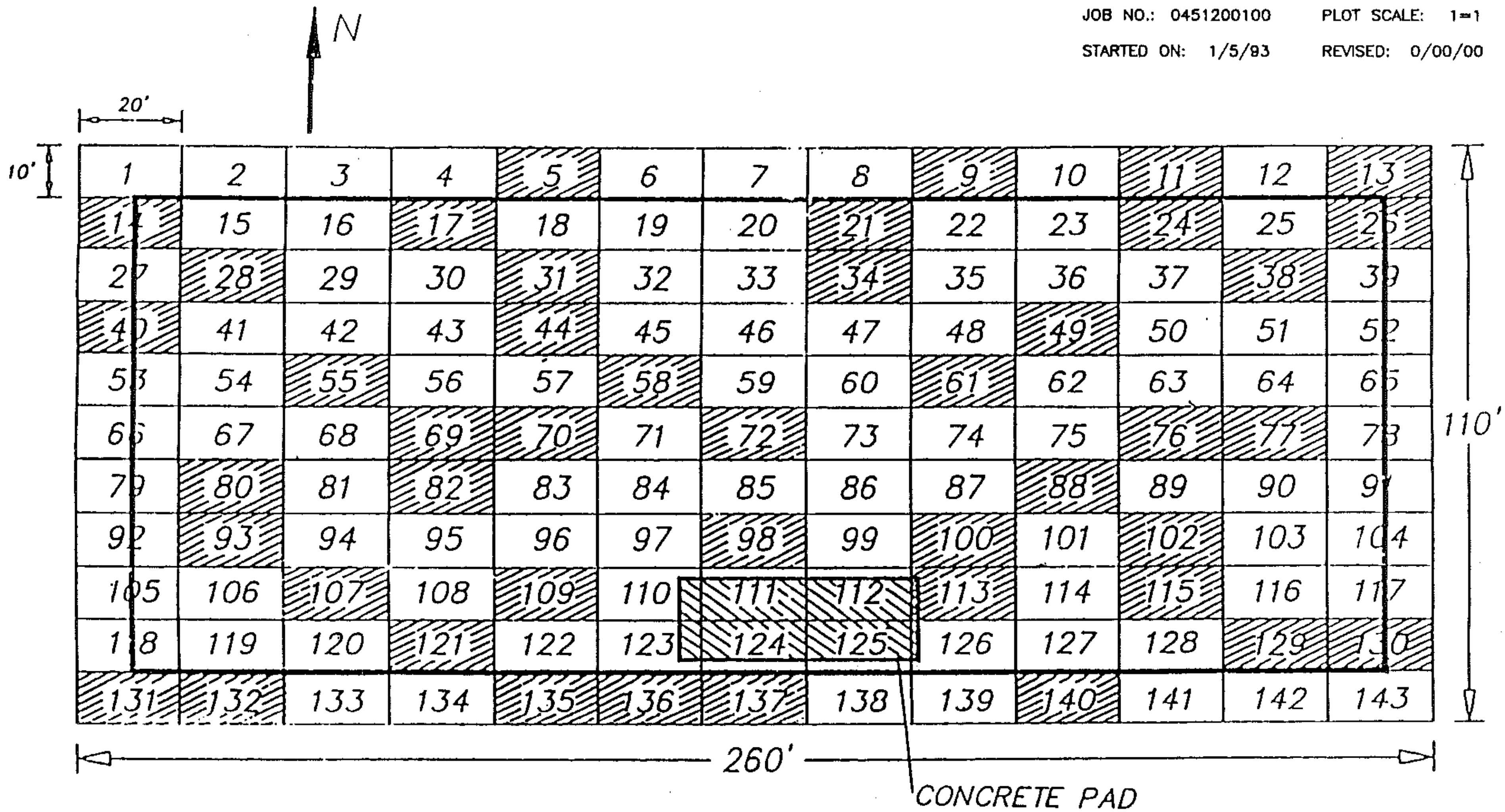


FIGURE 11.1

PPG INDUSTRIES, INC. CIRCLEVILLE, OHIO	SOIL SAMPLING GRID FOR FORMER LIQUID WASTE INCINERATOR	
ICF KAISER ENGINEERS PITTSBURGH, PA	DATE: 1/5/93	DR.: D.MAJERNIK
	SCALE: 1"=20'	DWG. NO.:FIG11-1

JOB NO.: 0451200100 PLOT SCALE: 1=1
STARTED ON: 1/5/93 REVISED: 0/00/00



NOTE: EACH SAMPLE WILL BE TAKEN AT THE CENTER OF THE DESIGNATED AREA.

FIGURE 11.2

PPG INDUSTRIES, INC. CIRCLEVILLE, OHIO	SOIL SAMPLING GRID FOR SOUTH PAD (90' X 240')
ICF KAISER ENGINEERS PITTSBURGH, PA	DATE: 1/5/93 — DR.: D.MAJERNIK SCALE: 1"=30' — DWG. NO.: FIG11-2

JOB NO.: 0451200100 PLOT SCALE: 1=1

STARTED ON: 1/5/93 REVISED: 0/00/00

N

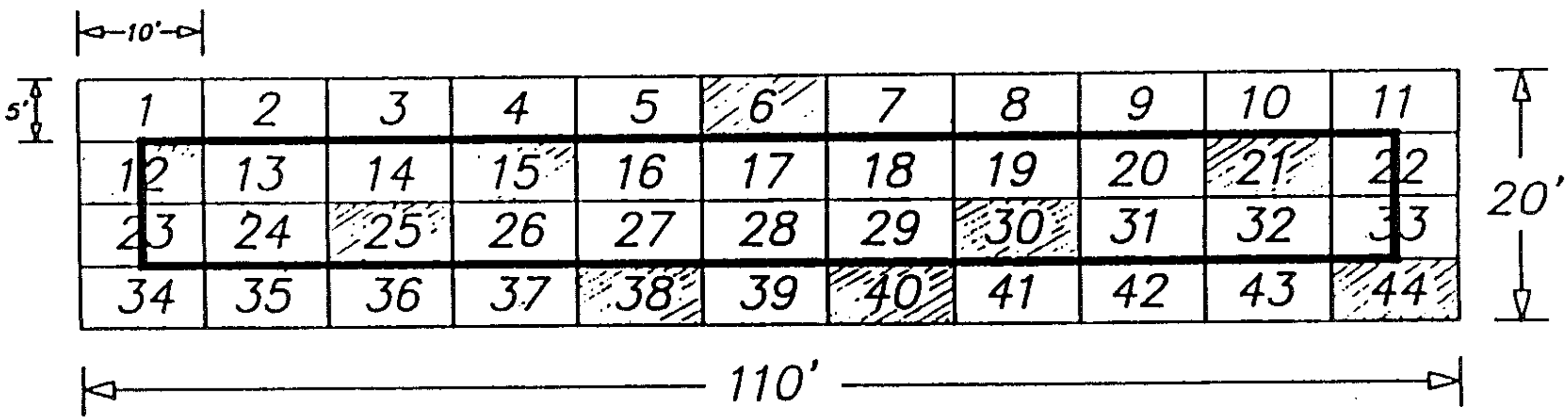


FIGURE 11.3

PPG INDUSTRIES, INC. CIRCLEVILLE, OHIO	SOIL SAMPLING GRID FOR WEST PAD (10' X 100')	
ICF KAISER ENGINEERS PITTSBURGH, PA	DATE: 1/5/93	DR.: D.MAJERNIK
	SCALE: 1"=15'	DWG. NO.: FIG11-3

12. DESCRIPTION OF REMOVAL EFFORTS

12.1 Incinerator Area

As described in Section 9, initial activities in 1989 were directed toward removal of residues from the Former Liquid Waste Incinerator, associated equipment, waste feed lines and the aqueous waste feed line. Due to the difficulty, expense, and subsequent waste generation, the incinerator and associated equipment was dismantled and treated as a hazardous waste. The incinerator foundation and containment pad concrete were also later removed. Although this concrete may have been considered "non-hazardous" under 40 CFR Part 261, it was disposed of as a hazardous waste. No soil was deliberately removed from the area, however, some soil was moved incidental to the concrete removal. These materials were loaded directly into rolloff boxes or dump trailers. No waste from this area was stockpiled on site. The materials were transported directly to the Adams Center Landfill in Fort Wayne, Indiana. A summary of wastes removed from this area is included in Table 12.1.

12.2 Still Pad

Results of rinseate analyses of the Still Pad, as described in Section 9, indicated that the concrete met the requirements for clean closure. However, subsequent activities in this area necessitated the removal of the Still Pad concrete. Although this concrete may have been considered "non-hazardous" under 40 CFR part 261, it was disposed of as a hazardous waste. The concrete was broken up and removed down to the underlying soil. The only soil removed was incidental to concrete removal as described in Section 12.1. The concrete was loaded directly onto rolloff boxes or dump trailers without stockpiling and transported to the Adams Center Landfill. A summary of wastes removed from this area is included in Table 12.1.

12.3 South Drum Storage Area

The concrete consolidation pad was broken up and removed down to the underlying soil. Although this concrete may have been considered "non-hazardous" under 40 CFR Part 261, it was disposed of as a hazardous waste. The only soil removed was incidental to concrete removal as described in Section 12.1. The waste was loaded directly into rolloff boxes or dump trailers without stockpiling and transported to the Adams Center Landfill. A summary of wastes removed from this area is included in Table 12.1.

12.4 West Drum Storage Pad

Initial sampling in 1989 was described in Section 11 indicated that the existing soils in the West Pad Drum Storage Area met the requirements for a clean closure. As a result, no material was removed from this area during closure activities.

TABLE 12.1

SUMMARY OF MATERIAL REMOVED

Area	Waste Type	Approximate Quantities Removed (lbs)	Manifest Numbers
Incinerator	Equipment, refractory	17,140	1484
		30,480	1485
		33,200	1486
Incinerator	Waste feed piping, foundation, containment pad	31,120	1672
		30,280	1673
Still Pad	Concrete, soil	32,040	1654
		28,900	1655
		31,100	1656
		37,320	1657
		40,540	1658
		28,620	1659
		34,500	1660
		26,800	1661
		37,500	1662
		51,860	1663
		26,920	1664
		28,900	1665
		29,400	1666
		29,470	1667
		40,500	1668
		40,180	1669
		28,020	1670
		29,600	1671
South Pad	Concrete, Consolidation Pad	29,120	1674

13. SPECIFIC CONSIDERATIONS

This section is reserved for details which are specific for landfill closures. The units covered under this Partial Closure are being clean closed per a risk assessment demonstration. Hence, no specific considerations are applicable.

14. DESCRIPTION OF EQUIPMENT CLEANING

The following describes the equipment cleaning efforts used in the vicinity of each of the interim status hazardous waste management units being closed. Residues generated by the scraping of equipment were handled as hazardous waste. Equipment was placed on a curbed, lined area and a pressure washer was used to remove any contamination. The decontamination areas were visqueen-lined, and large enough to ensure that no overspray was distributed outside the lined area. All recovered water was collected into a sump and then pumped into drums for sampling and analysis. Any rinse water which came in contact with listed hazardous wastes was managed as a listed waste. All decontamination pad plastic lining was disposed of in bulk or drummed and managed as a hazardous waste.

15. CERTIFICATION

PPG will provide certification that the former Liquid Waste Incinerator and three drum storage pads have been closed in accordance with the approved Partial Closure Plan. An independent registered Professional Engineer was present during critical stages of closure activities, such as incinerator demolition, line flushing and decontamination of the storage pads. The Documentation Report for these 1989 activities is included as Attachment H. This Engineer has documented that Partial Closure activities were performed in accordance with the applicable regulations and were consistent with the Ohio Environmental Protection Agency's Draft Closure Plan Review Guidance dated February 8, 1988. Upon approval of this Plan, which includes a risk assessment demonstration of clean closure, an independent registered Professional Engineer will certify that the Partial Closure is in accordance with the approved plan. PPG will certify closure in accordance with 40 CFR 265.115 and OAC 3745-66-15.

16. STATUS OF THE FACILITY AFTER CLOSURE

After the completion of partial closure activities, the Still Pad (see Figure 1.2) was converted to a satellite storage or "less-than-90-day-storage" area. The former Liquid Waste Incinerator in the manufacturing area and the other drum storage areas (the South Pad and West Pad) were permanently closed. The remainder of the hazardous waste management units at the PPG Circleville facility, which includes the ERU and five hazardous waste storage tanks at the resin plant, remain in operation.

Appendix A

ATTACHMENT A

Partial RCRA Closure - Analytical Summary

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
CV-89-0221	--	7137	CV-89-0221	Still Pad	M.H. Sediment Sample	17-Apr-89	@ Right	BDL	mg/kg	1.0	Analysis for Methanol, Iso-butanol, Butanol & Butyl Callosolve
						17-Apr-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL except below
						17-Apr-89	Ethylbenzene	2.48	mg/kg	0.167	
						17-Apr-89	Meth. Chloride	0.228	mg/kg	0.167	
						17-Apr-89	Xylenes	0.335	mg/kg	0.167	
						17-Apr-89	@ Right	BDL	mg/kg	1.0	Analysis for 9 PCBs all BDL except below
						17-Apr-89	Aroclor 1248	6.700	mg/kg	1.0	
CV-89-0223	--	7137	CV-89-0222	Still Pad	Pipe Sediment Sample	17-Apr-89	@ Right	BDL	mg/kg	1.0	Analysis for Methanol, Iso-butanol, Butanol, & Butyl Callosolve
						17-Apr-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL except below
						17-Apr-89	MEK	15.3	mg/kg	4.00	
						17-Apr-89	Xylenes	167.5	mg/kg	4.00	
						17-Apr-89	@ Right	BDL	mg/kg	1.0	Analysis for 9 PCBs all BDL except below
						17-Apr-89	Aroclor 1248	41,400	mg/kg	1.0	
CV-89-0223	--	7137	CV-89-0223	Still Pad	3rd Rinse	17-Apr-89	@ Right	BDL	mg/kg	1.0	Analysis for Methanol, iso-butanol, & Butanol
						17-Apr-89	Butyl Cellosolve	85.4	mg/L	1.0	Initial run results shown, confirmed @ 84.1 mg/L
						17-Apr-89	@ Right	BDL	µg/L	Varies	Analysis for HSL Volatiles all BDL except below
						17-Apr-89	Meth. Chloride	169	µg/L	100	
						17-Apr-89	@ Right	BDL	µg/L	1.0	Analysis for a PCBs and BDL
CV-89-0224	--	7137	CV-89-0224	Still Pad	Rinsewater Source	17-Apr-89	@ Right	BDL	mg/L	1.0	Anlysis for iso-butanol, Butanol, & Butyl Cellosolve
						17-Apr-89	Methanol	6.95	mg/L	1.0	
						17-Apr-89	@ Right	BDL	µg/L	Varies	Analysis for HSL Volatiles all BDL except below
						17-Apr-89	Acetone	22.3	µg/L	10.0	
						17-Apr-89	Meth. Chloride	3.2	µg/L	2.00	
						17-Apr-89	@ Right	BDL	µg/L	1.0	Analyses for 9 PCBs all BDL
8-131	S-131	7137	JC5491	South Pad	Soil Sample	17-Jul-89	@ Right	BDL	mg/kg	0.965	Analysis for n-Butanol, isobutanol, and Methanol
						17-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL except below
						17-Jul-89	Toluene	2	mg/kg	0.3	
003	S-132	7137	JC5492	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.952	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volaties all BDL
004	S-135	7137	JC5493	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.972	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	0.972	Analysis for HSL Volatiles all BDL except below
						18-Jul-89	Xylenes	0.11	mg/kg	0.3	
005	S-136	7137	JC5494	South pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.950	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL except below
						18-Jul-89	Xylenes	0.6	mg/kg	0.3	
006	S-137	7137	JC5495	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.971	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
007	S-140	7137	JC5496	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.960	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
008	S-130	7137	JC5497	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.958	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
009	S-129	7137	JC5498	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.967	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
010	S-126	7137	JC5499	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.950	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Toluene	0.4	mg/kg	0.3	
011	S-124	7137	JC5500	South pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.952	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
012	S-121	7137	JC5501	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.952	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
013	S-107	7137	JC5502	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.971	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Meth. Chloride	0.3	mg/kg	0.3	
						18-Jul-89	Toluene	0.4	mg/kg	0.3	
014	S-109	7137	JC5503	South pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.992	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
015	S-109	7137	JC5530	Souh Pad	Soil Sample (Dupl. S-109)	18-Jul-89	@ Right	BDL	mg/kg	0.969	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Xylenes	0.6	mg/kg	0.3	
016	S-113	7137	HC5504	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.993	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
017	S-111	7137	JC5505	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.967	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
018	S-112	7137	JC5506	South Pad	Soil Sample	18-July-89	@ Right	BDL	mg/kg	0.977	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Toluene	0.4	mg/kg	0.3	
019	S-115	7137	JC5507	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.973	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
020	S-102	7137	JC5508	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.960	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
021	S-100	7137	JC5509	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.964	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Ethylbenzene	2	mg/kg	0.6	
						18-Jul-89	Meth. Chloride	0.3	mg/kg	0.3	
						18-Jul-89	Toluene	21	mg/kg	0.3	
						18-Jul-89	Xylenes	8	mg/kg	0.3	
022	S-96	7137	JC5510	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.991	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
023	S-93	7137	JC5511	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.988	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
024	S-80	7137	JC5512	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.964	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Toluene	0.5	mg/kg	0.3	

PPG-CIRCLEVILLE PARTIAL RCRA CLOSURE - ANALYTICAL RESULTS SUMMARY

Attachment A

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
025	S-88	7137	JC5513	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.999	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Meth. Chloride	0.5	mg/kg	0.3	
						18-Jul-89	Toluene	2	mg/kg	0.3	
026	S-82	7137	JC5514	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.957	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
C541	C541	7137	JC5541	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.25	Analysis for 7 PCBs all BDL, except below
						18-Jul-89	Arclor 1254	0.334	mg/kg	0.25	
027	S-77	7137	JC5515	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.966	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Meth. Chloride	0.3	mg/kg	0.3	
028	S-76	7137	JC5516	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.993	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Ethylbenzene	0.3	mg/kg	0.3	
						18-Jul-89	Toluene	17	mg/kg	0.3	
						18-Jul-89	Xylenes	0.16	mg/kg	0.3	
029	S-72	7137	JC5517	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	1.000	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Ethylbenzene	0.4	mg/kg	0.3	
						18-Jul-89	Meth. Chloride	0.3	mg/kg	0.3	
						18-Jul-89	Xylenes	0.18	mg/kg	0.3	
030	S-70	7137	JC5518	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.960	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
031	S-69	7137	JC5519	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.990	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Ethylbenzene	0.3	mg/kg	0.3	
						18-Jul-89	Meth. Chloride	3	mg/kg	0.3	
						18-Jul-89	Toluene	1	mg/kg	0.3	
						18-Jul-89	Xylenes	1.8	mg/kg	0.3	
032	S-65	7137	JC5520	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.974	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Meth. Chlorde	0.8	mg/kg	0.3	
033	S-65	7137	JC5540	South Pad	Soil Sample (Dupl. S-55)	18-Jul-89	@ Right	BDL	mg/kg	0.977	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Meth. Chloride	0.3	mg/kg	0.3	
034	S-58	7137	JC5521	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.962	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Meth. Chloride	0.3	mg/kg	0.3	
						18-Jul-89	Toluene	0.3	mg/kg	0.3	
035	S-61	7137	JC5522	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.976	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Toluene	0.3	mg/kg	0.3	
036	S-49	7137	JC5523	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.953	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
037	S-44	7137	JC5524	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.952 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
038	S-40	7137	JC5525	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Toluene	BDL BDL 0.4	mg/kg mg/kg mg/kg	0.964 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
039	S-26	7137	JC5526	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.961 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
040	S-34	7137	JC5527	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.961 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
041	S-31	7137	JC5526	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.965 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
042	S-38	7137	JC5529	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.970 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
043	S-26	7137	JC5530	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.966 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
044	S-24	7137	JC5531	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.953 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
045	S-21	7137	JC5532	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.960 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
046	S-17	7137	JC5533	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	1.000 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
047	S-5	7137	JC5534	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.979 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
048	S-14	7137	JC5535	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.999 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
049	S-9	7137	JC5536	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.996 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
050	S-11	7137	JC5537	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.993 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
051	S-13	7137	JC5538	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.983 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
C544	C544	7137	JC5542	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right Aroclor 1254	BDL 3.56	mg/kg mg/kg	0.25 0.25	Analysis for 7 PCBs and BDL, except below
052	--	7137	JC5552	General	Water Sample (Trip Blank)	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/L mg/L	1.000 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
053	W-44	7137	JC5543	West Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right Methanol @ Right Toluene	BDL 0.968 BDL 1.34	mg/kg mg/kg mg/kg mg/kg	0.988 0.968 Varies 0.196	Analysis for n-Butanol and Isobutanol Only detected alcohol in West Pad soils Analysis for HSL Volatiles, all BDL except below

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
054	W-21	7137	JC5544	West pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.952 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
055	W-30	7137	JC5545	West Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.958 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
056	W-40	7137	JC5548	West Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.988 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
057	W-6	7137	JC5547	West Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Ethylbenzene Xylenes	BDL BDL 0.229 2.16	mg/kg mg/kg mg/kg mg/kg	0.964 Varies 0.186 0.186	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, excpet below
058	W-38	7137	JC5548	West Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Toluene	BDL BDL 0.621	mg/kg mg/kg mg/kg	0.973 Varies 0.190	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
059	W-15	7137	JC5549	West Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.977 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
060	W-26	7137	JC5550	West Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.944 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
061	W-12	7137	JC5551	West Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Xylenes	BDL BDL 0.454	mg/kg mg/kg mg/kg	0.979 Varies 0.199	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
C542	C542	7137	JC5554	West Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.25	Analysis for 7 PCBs, all BDL
062	W-12	7137	JC5553	West Pad	Soil Sample (Dupl. W-12)	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.996 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
063	I-9	7137	JC5556	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.975 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
064	I-44	7137	JC5556	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.929 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
065	I-77	7137	JC5557	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.958 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
066	I-64	7137	JC5558	Incinerator Area	soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Ethylbenzene Xylenes	BDL BDL 0.3 0.9	mg/kg mg/kg mg/kg mg/kg	0.967 Varies 0.3 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except BDL
067	I-85	7137	JC5559	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Ethylbenzene Xylenes	BDL BDL 0.6 0.7	mg/kg mg/kg mg/kg mg/kg	0.996 Varies 0.3 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
068	I-106	7137	JC5560	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.991 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
069	I-72	7137	JC5561	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.962 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
070	1-72	7137	JC5573	Incinerator Area	Soil Sample (Dupl. I-72)	18-Jul-89	@ Right	BDL	mg/kg	0.933	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Meth. Chloride	0.4	mg/kg	0.3	
						18-Jul-89	Xylenes	1.7	mg/kg	0.3	
071	1-92	7137	JC5562	Incinerator Area	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	1.000	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
072	1-70	7137	JC5563	Incinerator Area	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.944	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Meth. Chloride	0.3	mg/kg	0.3	
073	1-76	7137	JC5564	Incinerator Area	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.932	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
074	1-26	7137	JC5565	Incinerator Area	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.990	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
075	1-58	7137	JC5566	Incinerator Area	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.955	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
076	1-6	7137	JC5567	Incinerator Area	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.991	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
077	1-24	7137	JC5568	Incinerator Area	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.969	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Ethylbenzene	2	mg/kg	0.3	
						18-Jul-89	Meth. Chloride	4	mg/kg	0.3	
						18-Jul-89	Xylenes	4	mg/kg	0.3	
078	1-26	7137	JC5569	Incinerator Area	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.992	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Meth. Chloride	0.4	mg/kg	0.3	
079	1-48	7137	JC5670	Incinerator Area	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.978	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Xylenes	0.4	mg/kg	0.3	
080	1-45	7137	JC5571	Incinerator Area	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.945	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Ethylbenzene	0.6	mg/kg	0.3	
						18-Jul-89	2-Hexanone	3	mg/kg	0.6	
						18-Jul-89	Meth. Chloride	0.4	mg/kg	0.3	
						18-Jul-89	Xylenes	2	mg/kg	0.3	
081	1-60	7137	JC5572	Incinerator Area	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.931	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Meth. Chloride	0.4	mg/kg	0.3	
C543	C543	7137	JC5574	Incinerator Area	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.25	Analysis for 7 PCBs all BDL except below
						18-Jul-89	Aroclor 1254	1.79	mg/kg	0.25	
						18-Jul-89	@ Right	BDL	µg/kg	Varies	Analysis for 12 Cibenzo-P-Dioxins & Furene all BDL except below
						18-Jul-89	HpCDD	0.37	µg/kg	--	
						18-Jul-89	OCDD	1.91	µg/kg	--	
						18-Jul-89	2,37,a-TCDF	0.15	µg/kg	--	
						18-Jul-89	TCDF	0.22	µg/kg	--	

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
085	--	7137	085	Incinerator	Final Phase Line 2	24-Aug-89	Methanol	93.1	mg/L	1.0	
						24-Aug-89	Iso-Butanol	10.1	mg/L	1.0	
						24-Aug-89	Butanol	86.3	mg/L	1.0	
						24-Aug-89	@ Right	BDL	µg/L	Varies	
						24-Aug-89	2-Butanone	39,000	µg/L	1,000	Analysis for HSL, Volatiles all BDL except below
						24-Aug-89	Ethylbenzene	36,000	µg/L	500	
						24-Aug-89	2-Hexanone	720,000	µg/L	1,000	
						24-Aug-89	Toluene	75,000	µg/L	500	
						24-Aug-89	Xylenes	240,000	µg/L	500	
086	--	7137	086	Incinerator	Distilled Rinse Water	24-Aug-89	@ Right	BDL	mg/L	1.0	Analysis for n-Butanol, isobutanol, and Methanol
						24-Aug-89	@ Right	BDL	µg/L	Varies	Analysis for HSL Volatiles all BDL, except below
						24-Aug-89	Toluene	170	µg/L	6	
087	--	7137	087	Incinerator	Service Water	24-Aug-89	@ Right	BDL	mg/L	1.0	Analysis for n-Butanol, isobutanol, and Methanol
						24-Aug-89	@ Right	BDL	µg/L	Varies	Analysis for HSL Volatiles all BDL
088	--	7137	088	Incinerator	Travel Blank	24-Aug-89	@ Right	BDL	µg/L	Varies	Analysis for HSL Volatiles all BDL
089	--	7137	089	Incinerator	Final Rinse Line 1	24-Aug-89	Methanol	16.5	mg/L	1.0	
						24-Aug-89	Iso-butanol	1.71	mg/L	1.0	
						24-Aug-89	Butanol	18.9	mg/L	1.0	
						24-Aug-89	@ Right	BDL	µg/L	Varies	
						24-Aug-89	2-Butanone	11,000	µg/L	1,000	Analysis for HSL Volatiles all BDL, except below
						24-Aug-89	Ethylbenzene	24,000	µg/L	1,000	
						24-Aug-89	2-Hexanone	300,000	µg/L	1,000	
						24-Aug-89	Toluene	33,000	µg/L	600	
						24-Aug-89	Xylenes	180,000	µg/L	600	
090	--	7137	090	Incinerator	Final Rinse Aqueous Waste	24-Aug-89	@ Right	BDL	mg/L	1.0	
						24-Aug-89	@ Right	BDL	µg/L	Varies	Analysis for n-Butanol, isobutanol, and Methanol
						24-Aug-89	Ethylbenzene	9,900	µg/L	500	Analysis for HSL Volatiles all BDL, except below
						24-Aug-89	2-Hexanone	1,900	µg/L	1,000	
						24-Aug-89	Toluene	15,000	µg/L	500	
						24-Aug-89	Xylenes	31,000	µg/L	500	

Appendix B

ATTACHMENT B

Partial RCRA Closure - Detected Compound Summary

PPG - CIRCLEVILLE PARTIAL RCRA CLOSURE - DETECTED COMPOUND SUMMARY

Attachment B

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
CV-89-0221	-	7137	CV-89-0221	STILL PAD	M.H. SEDIMENT SAMPLE	17-Apr-89	ETHYLBENZENE	2.48	mg/kg	0.167	
						17-Apr-89	METH. CHLORIDE	0.228	mg/kg	0.167	
						17-Apr-89	XYLENES	0.335	mg/kg	0.167	
						17-Apr-89	ARCOCLOR 1248	6,700	mg/kg	1.0	
CV-89-0222	-	7137	CV-89-0222	STILL PAD	PIPE SEDIMENT SAMPLE	17-Apr-89	MEK	15.3	mg/kg	4.00	
						17-Apr-89	XYLENES	167.5	mg/kg	4.00	
						17-Apr-89	AROCLOR 1248	41,400	mg/kg	1.0	
CV-89-0223	-	7137	CV-89-0223	STILL PAD	3rd RINSE	17-Apr-89	BUTYL CELLOSOLVE	85.4	mg/L	1.0	Initial run results shown, confirmed @ 84.1 mg/L
						17-Apr-89	METH. CHLORIDE	169	ug/L	100	
CV-89-0224	-	7137	CV-89-0224	STILL PAD	RINSEWATER SOURCE	17-Apr-89	METHANOL	6.95	mg/L	1.0	
						17-Apr-89	ACETONE	22.3	ug/L	10.0	
						17-Apr-89	METH. CHLORIDE	3.2	ug/L	2.0	
S-131	S-131	7137	S-131	SOUTH PAD	SOIL SAMPLE	17-Jul-89	TOLUENE	2	mg/kg	0.3	
004	S-135	7137	004	SOUTH PAD	SOIL SAMPLE	18-Jul-89	XYLENES	0.11	mg/kg	0.3	
005	S-136	7137	005	SOUTH PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.8	mg/kg	0.3	
010	S-126	7137	010	SOUTH PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.4	mg/kg	0.3	
013	S-107	7137	013	SOUTH PAD	SOIL SAMPLE	18-Jul-89	METH. CHLORIDE	0.3	mg/kg	0.3	
						18-Jul-89	TOLUENE	0.4	mg/kg	0.3	
015	S-109	7137	015	SOUTH PAD	SOIL SAMPLE (DUPL. S-109)	18-Jul-89	XYLENES	0.6	mg/kg	0.3	
018	S-112	7137	018	SOUTH PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.4	mg/kg	0.3	
021	S-100	7137	021	SOUTH PAD	SOIL SAMPLE	18-Jul-89	ETHYLBENZENE	2	mg/kg	0.6	
						18-Jul-89	METH. CHLORIDE	0.3	mg/kg	0.3	
						18-Jul-89	TOLUENE	21	mg/kg	0.3	
						18-Jul-89	XYLENES	8	mg/kg	0.3	
024	S-80	7137	024	SOUTH PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.5	mg/kg	0.3	
025	S-88	7137	025	SOUTH PAD	SOIL SAMPLE	18-Jul-89	METH. CHLORIDE	0.5	mg/kg	0.3	
						18-Jul-89	TOLUENE	2	mg/kg	0.3	
C541	C541	7137	JC6641	SOUTH PAD	SOIL SAMPLE	18-Jul-89	AROCLOR 1254	0.334	mg/kg	0.25	
027	S-77	7137	027	SOUTH PAD	SOIL SAMPLE	18-Jul-89	METH. CHLORIDE	0.3	mg/kg	0.3	
028	S-76	7137	028	SOUTH PAD	SOIL SAMPLE	18-Jul-89	ETHYLBENZENE	0.3	mg/kg	0.3	
						18-Jul-89	TOLUENE	17	mg/kg	0.3	
						18-Jul-89	XYLENES	0.16	mg/kg	0.3	
029	S-72	7137	029	SOUTH PAD	SOIL SAMPLE	18-Jul-89	ETHYLBENZENE	0.4	mg/kg	0.3	
						18-Jul-89	METH. CHLORIDE	0.3	mg/kg	0.3	
						18-Jul-89	XYLENES	0.18	mg/kg	0.3	
031	S-69	7137	031	SOUTH PAD	SOIL SAMPLE	18-Jul-89	ETHYLBENZENE	0.3	mg/kg	0.3	
						18-Jul-89	METH. CHLORIDE	3	mg/kg	0.3	
						18-Jul-89	TOLUENE	1	mg/kg	0.3	
						18-Jul-89	XYLENES	1.8	mg/kg	0.3	

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
032	S-55	7137	032	SOUTH PAD	SOIL SAMPLE	18-Jul-89	METH. CHLORIDE	0.8	mg/kg	0.3	
033	S-55	7137	033	SOUTH PAD	SOIL SAMPLE (DUPL. S-55)	18-Jul-89	METH. CHLORIDE	0.3	mg/kg	0.3	
034	S-58	7137	034	SOUTH PAD	SOIL SAMPLE	18-Jul-89 18-Jul-89	METH. CHLORIDE TOLUENE	0.3 0.3	mg/kg mg/kg	0.3 0.3	
035	S-61	7137	035	SOUTH PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.3	mg/kg	0.3	
038	S-40	7137	038	SOUTH PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.4	mg/kg	0.3	
C544	C544	7137	JC5542	SOUTH PAD	SOIL SAMPLE	18-Jul-89	AROCLOR 1254	3.56	mg/kg	0.25	
053	W-44	7137	JC5543	WEST PAD	SOIL SAMPLE	18-Jul-89 18-Jul-89	METHANOL TOLUENE	0.968 1.34	mg/kg mg/kg	0.968 0.198	Only detected alcohol in West Pad soils
057	W-6	7137	JC5547	WEST PAD	SOIL SAMPLE	18-Jul-89 18-Jul-89	ETHYLBENZENE XYLENES	0.229 2.16	mg/kg mg/kg	0.186 0.186	
058	W-38	7137	JC5548	WEST PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.621	mg/kg	0.190	
061	W-12	7137	JC5551	WEST PAD	SOIL SAMPLE	18-Jul-89	XYLENES	0.454	mg/kg	0.199	
066	I-64	7137	066	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89 18-Jul-89	ETHYLBENZENE XYLENES	0.3 0.9	mg/kg mg/kg	0.3 0.3	
067	I-85	7137	067	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89 18-Jul-89	ETHYLBENZENE XYLENES	0.6 0.7	mg/kg mg/kg	0.3 0.3	
070	I-72	7137	070	INCINERATOR AREA	SOIL SAMPLE (DUPL. I-72)	18-Jul-89 18-Jul-89	METH. CHLORIDE XYLENES	0.4 1.7	mg/kg mg/kg	0.3 0.3	
072	I-70	7137	072	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89	METH. CHLORIDE	0.3	mg/kg	0.3	
077	I-24	7137	077	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89 18-Jul-89 18-Jul-89	ETHYLBENZENE METH. CHLORIDE XYLENES	2 4 4	mg/kg mg/kg mg/kg	0.3 0.3 0.3	
078	I-28	7137	078	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89	METH. CHLORIDE	0.3	mg/kg	0.3	
079	I-48	7137	079	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89	XYLENES	0.4	mg/kg	0.3	
080	I-45	7137	080	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	ETHYLBENZENE 2-HEXANONE METH. CHLORIDE XYLENES	0.6 3 0.4 2	mg/kg mg/kg mg/kg mg/kg	0.3 0.6 0.3 0.3	
081	I-50	7137	081	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89	METH. CHLORIDE	0.4	mg/kg	0.3	
C543	C543	7137	JC5574	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	AROCLOR 1254 HpCDD OCDD 2,3,7,8-TCDF TCDP	1.79 0.37 1.91 0.15 0.22	mg/kg ug/kg ug/kg ug/kg ug/kg	0.25 - - - -	

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
085	-	7137	085	INCINERATOR	FINAL RINSE LINE 2	24-Aug-89	METHANOL	93.1	mg/L	1.0	
						24-Aug-89	ISO-BUTANOL	10.1	mg/L	1.0	
						24-Aug-89	BUTANOL	85.3	Mg/L	1.0	
						24-Aug-89	2-BUTANONE	39,000	ug/L	1,000	
						24-Aug-89	ETHYLBENZENE	36,000	ug/L	500	
						24-Aug-89	2-HEXANONE	720,000	ug/L	1,000	
						24-Aug-89	TOLUENE	75,000	ug/L	500	
						24-Aug-89	XYLENES	240,000	ug/L	500	
086	-	7137	086	INCINERATOR	DISTILLED RINSE WATER	24-Aug-89	TOLUENE	170	ug/L	5	
089	-	7137	089	INCINERATOR	FINAL RINSE LINE 1	24-Aug-89	METHANOL	16.5	mg/L	1.0	
						24-Aug-89	ISO-BUTANOL	1.71	mg/L	1.0	
						24-Aug-89	BUTANOL	18.9	mg/L	1.0	
						24-Aug-89	2-BUTANONE	11,000	ug/L	1,000	
						24-Aug-89	ETHYLBENZENE	24,000	ug/L	1,000	
						24-Aug-89	2-HEXANONE	300,000	ug/L	1,000	
						24-Aug-89	TOLUENE	33,000	ug/L	500	
						24-Aug-89	XYLENES	180,000	ug/L	500	
090	-	7137	090	INCINERATOR	FINAL RINSE AQUEOUS WASTE	24-Aug-89	ETHYLBENZENE	9,900	ug/L	500	
						24-Aug-89	2-HEXANONE	1,900	ug/L	1,000	
						24-Aug-89	TOLUENE	15,000	ug/L	500	
						24-Aug-89	XYLENES	31,000	ug/L	500	
CV-89-1503	-	9-21-89	12372-89	STILL PAD	COMPOSITE CONCRETE & SOIL	18-Sep-89	@RIGHT	BDL	mg/L	VARIES	TCLP Analysis for 8 RCRA metals all BDL except below
						18-Sep-89	BARIUM	1.1	mg/L	UNKNOWN	
CV-89-1503	-	9-21-89	9697	STILL PAD	COMPOSITE CONCRETE & SOIL	18-Sep-89	@RIGHT	BDL	ug/L	VARIES	TCLP Analysis for 25 RCRA organics all BDL

Appendix C

ATTACHMENT C

Addendum to Sampling Activities Associated with Partial Closure Plan

ADDENDUM TO SAMPLING ACTIVITIES ASSOCIATED WITH PARTIAL CLOSURE PLAN

FOR

PPG INDUSTRIES, INC. CIRCLEVILLE, OHIO

Prepared for:

PPG INDUSTRIES, INC.
Coatings and Resins
Circleville, Ohio

Prepared by:

ICF KAISER ENGINEERS, INC.
Four Gateway Center
Pittsburgh, Pennsylvania 15222

June, 1993

PARTIAL CLOSURE PLAN
TABLE OF CONTENTS

List of Tables

List of Figures

1.0 ADDENDUM INTRODUCTION

On January 14, 1991, PPG Industries, Inc. submitted a revised partial closure plan for four interim status RCRA TSD units identified as the Still Pad Drum Storage Area, West Drum Storage Pad, the South Drum Storage Pad, and the Former Liquid Waste Incinerator. Since the submittal of the revised plan, PPG and OEPA have engaged in several rounds of negotiations centering around the definition of the full extent of contamination attributed to three of these RCRA units, (West Drum Storage Pad, South Drum Storage Pad, and the Liquid Waste Incinerator).

This addendum presents a description of the field sampling conducted as a result of negotiations with OEPA, the results of sample analysis and a brief discussion of the results.

2.0 SAMPLING AND ANALYSIS PLAN

2.1 INTRODUCTION

The purpose of this section is to describe the sampling methodology and analysis associated with the collection of soil samples offered in response to OEPA comments as presented in PPG's letters dated July 27, 1992, and August 7, 1992. The Proposed Sampling Program was subsequently approved by the Ohio EPA on August 31, 1992. Appendix A includes copies of the correspondence.

2.2 FIELD SAMPLING ACTIVITIES

2.2.1 Re-establishment of Grids

On September 21 and 22, 1992 a two man sampling crew re-established the sampling grid system originally associated with the closure activities of the Former Liquid Incinerator Pad, the West Pad Drum Storage Area, and the South Pad Drum Storage Area. As part of this activity, additional grids, as concurred with OEPA, were established to further define the possible extent of contamination.

Due to a missed holding time for some of the samples obtained from grids at the 12-24 inch interval on September 21-22, 1992, additional sampling was performed on October 31, 1992. Five additional soil samples and one field blank were obtained at that time. The location and sampling grids are presented below.

- Former Liquid Incinerator Pad — Grids 24 and 45
- South Pad Drum Storage — Grid 100
- West Pad Drum Storage — Grids 6 and 44

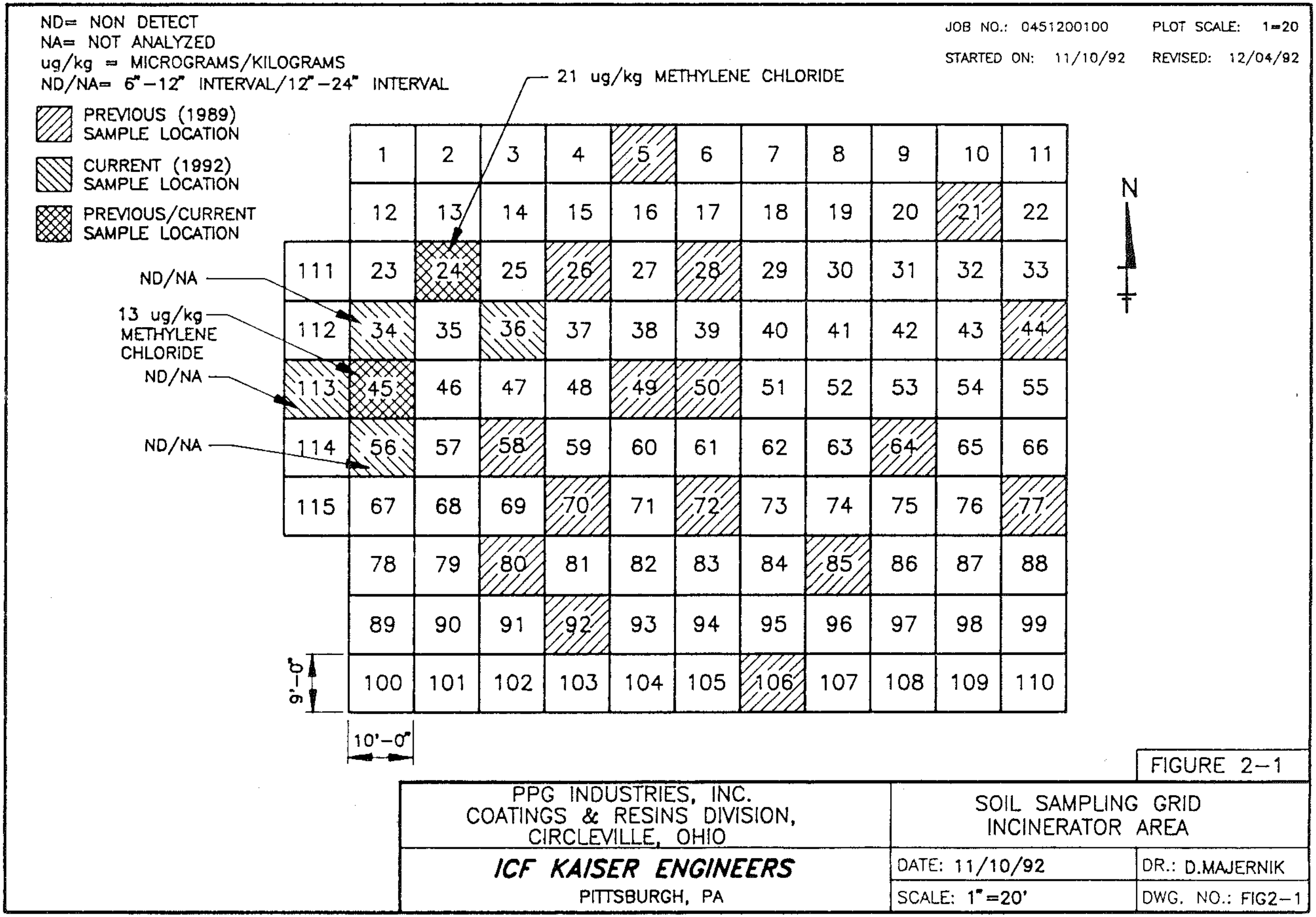
All sampling was performed following the same methodology used in prior sampling events. No variation of methods occurred.

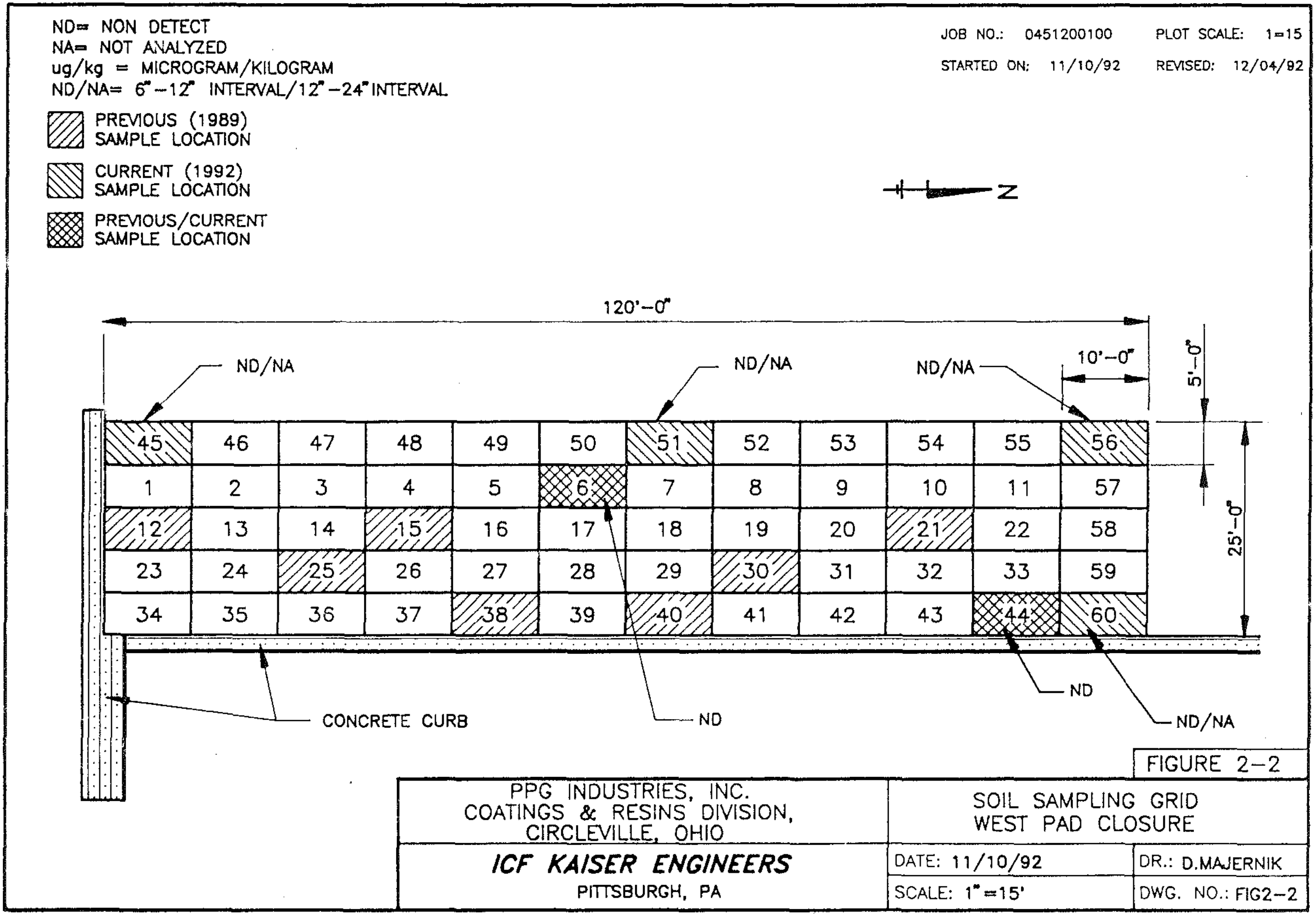
2.2.1.1 Former Liquid Incinerator Area

Sampling Grids 24, 34-36, 45-47 and 56-58 were re-established. Sampling grids 111-115 were added to the western boundary of the existing grid system. As part of the Former Liquid Incinerator Pad grid re-establishment procedure, the location of the former incinerator stack was verified from photos and previous work performed by plant personnel. Figure 2-1 illustrates the sample grid.

2.2.1.2 West Pad Drum Storage

Along with the re-establishment of the former grid system, 16 new sampling grids were added. Grids 45-60 were added to the western and northern boundaries of the existing grid system. Figure 2-2 illustrates the sampling grid.


ND= NON DETECT
NA= NOT ANALYZED
ug/kg = MICROGRAMS/KILOGRAMS
ND/NA= 6"-12" INTERVAL/12"-24" INTERVAL
PREVIOUS (1989) SAMPLE LOCATION
CURRENT (1992) SAMPLE LOCATION
PREVIOUS/CURRENT SAMPLE LOCATION
JOB NO.: 0451200100
PLOT SCALE: 1=20
STARTED ON: 11/10/92
REVISED: 12/04/92
21 ug/kg METHYLENE CHLORIDE
ND/NA
13 ug/kg METHYLENE CHLORIDE
ND/NA
ND/NA
N
1 2 3 4 5 6 7 8 9 10 11
12 13 14 15 16 17 18 19 20 21 22
111 23 24 25 26 27 28 29 30 31 32 33
112 34 35 36 37 38 39 40 41 42 43 44
113 45 46 47 48 49 50 51 52 53 54 55
114 56 57 58 59 60 61 62 63 64 65 66
115 67 68 69 70 71 72 73 74 75 76 77
78 79 80 81 82 83 84 85 86 87 88
89 90 91 92 93 94 95 96 97 98 99
100 101 102 103 104 105 106 107 108 109 110
9'-0"
10'-0"
FIGURE 2-1
PPG INDUSTRIES, INC.
COATINGS & RESINS DIVISION,
CIRCLEVILLE, OHIO
ICF KAISER ENGINEERS
PITTSBURGH, PA
SOIL SAMPLING GRID
INCINERATOR AREA
DATE: 11/10/92
DR.: D.MAJERNIK
SCALE: 1"=20'
DWG. NO.: FIG2-1


ND= NON DETECT
NA= NOT ANALYZED
ug/kg = MICROGRAM/KILOGRAM
ND/NA= 6"-12" INTERVAL/12"-24" INTERVAL
PREVIOUS (1989) SAMPLE LOCATION
CURRENT (1992) SAMPLE LOCATION
PREVIOUS/CURRENT SAMPLE LOCATION
JOB NO.: 0451200100
PLOT SCALE: 1=15
STARTED ON: 11/10/92
REVISED: 12/04/92
N
120'-0"
10'-0"
5'-0"
25'-0"
ND/NA
ND/NA
ND/NA
45 46 47 48 49 50 51 52 53 54 55 56
1 2 3 4 5 6 7 8 9 10 11 57
12 13 14 15 16 17 18 19 20 21 22 58
23 24 25 26 27 28 29 30 31 32 33 59
34 35 36 37 38 39 40 41 42 43 44 60
CONCRETE CURB
ND
ND
ND/NA
FIGURE 2-2
PPG INDUSTRIES, INC.
COATINGS & RESINS DIVISION,
CIRCLEVILLE, OHIO
SOIL SAMPLING GRID
WEST PAD CLOSURE
ICF KAISER ENGINEERS
PITTSBURGH, PA
DATE: 11/10/92
DR.: D.MAJERNIK
SCALE: 1"=15'
DWG. NO.: FIG2-2

2.2.1.3 South Pad Drum Storage

Within the South Pad Drum Storage area previous grids 53, 66, 79, 92, 100 and 105 were re-established. Additional grids, 144-154, were added to the west and southern portions of the grid system. Figure 2-3 illustrates the sampling grids.

2.2.2 Soil Sampling Methodology

Soil samples obtained from new grids were collected at depths of 6-12 inches and 12-24 inches below the ground surface. A biased sampling approach was used to obtain samples from grids previously determined to contain detectable levels of chemicals. These samples were collected at a depth of 12-24 inches below the ground surface. Table 1 summarizes the grid numbers and sampling depths for each closure unit.

All samples were collected utilizing the following procedures. The first 6 inches of soil was removed using a hand-held stainless steel bucket auger. A stainless steel split-spoon was then manually driven to the desired depth to obtain the deeper sample. All sampling equipment was decontaminated between sample locations with a mild detergent followed by a deionized water rinse.

Approximately 4 oz. of material was collected from each split spoon for analysis. The sample was obtained by withdrawing the appropriate amount of soil from the split-spoon with stainless steel spatulas. Labels detailing, the name of the sampler, date, time, method of analysis and any preservatives were marked on the sampling jar. The samples were then placed on ice for shipment to the analytical laboratory.

2.2.3 Sample Analysis

All soil samples were sent by overnight courier to NET, Cambridge Division in Bedford, Massachusetts for analysis. Soil samples were analyzed for Volatile Organic Compounds (VOCs) by EPA SW-846 Method 8240. Samples from the 6-12 inch depth interval were analyzed under a turnaround time of 5 days. The accelerated turnaround time allowed the corresponding 12-24 inch interval samples to be analyzed within the required holding time of 14 days. The initial soil samples were received at the NET Laboratories on September 24 and 25, 1992 and were analyzed by September 30, 1992. The second round of samples were received at the lab on November 2, 1992 and were analyzed by November 6, 1992.

A field blank was submitted to NET for each day of field activity for a total of three samples. NET ran a method blank at the beginning and end of each sample batch. A total of six method blanks were run.

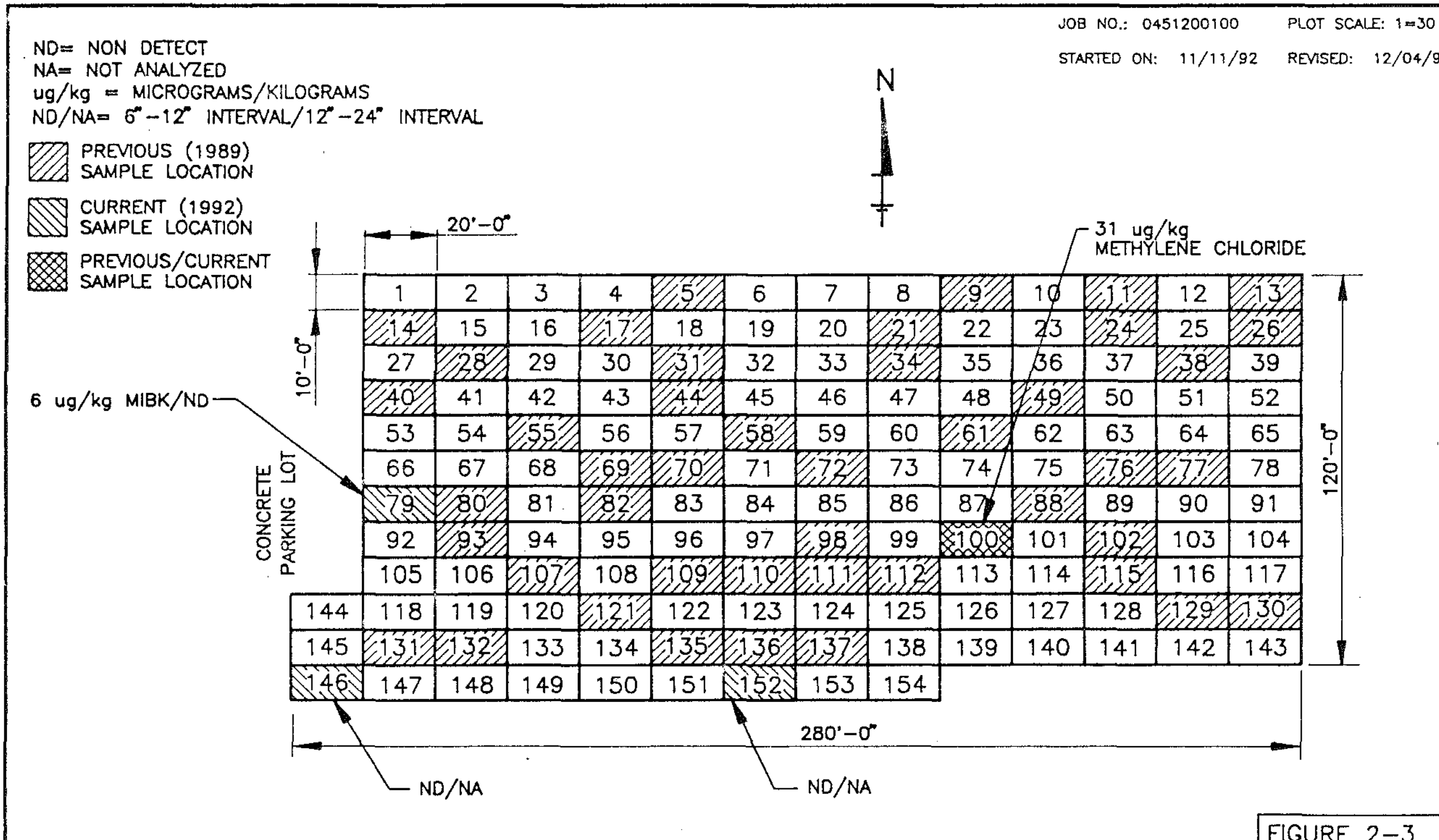


FIGURE 2-3

PPG INDUSTRIES, INC.
COATINGS & RESINS DIVISION,
CIRCLEVILLE, OHIO

SOIL SAMPLING GRID
SOUTH PAD CLOSURE

ICF KAISER ENGINEERS
PITTSBURGH, PA

DATE: 11/10/92 | DR.: D.MAJERNIK
SCALE: 1"=40' | DWG. NO.: FIG2-3

3.0 INVESTIGATION RESULTS

With the exception of sample CV-92-350-S79, all of the initially analyzed samples obtained on September 21-22, 1992 showed non-detectable levels of VOCs. Sample CV-92-350-S79 was obtained from Grid 79 at the South Pad Drum Storage Area at the 6-12 inch interval. The sample exhibited a trace concentration of 6.0 ug/kg 4-methyl-2-pentanone (MIBK). A summary of analytical results is included in Table 3-1. Raw analytical data are included as Appendix B.

Three of the five samples analyzed during the second sampling event (October 31, 1992) exhibited detectable concentrations of methylene chloride. These samples, as stated earlier, were obtained from grids previously determined to contain detectable levels of chemicals. Within the Former Liquid Incinerator Pad, the 12-24 inch sample from Grid 24 contained methylene chloride at 21 ug/kg and the 12-24 inch sample from Grid 45 contained methylene chloride at 13 ug/kg. In the South Pad Drum Storage Area, the 12-24 inch sample from Grid 100 exhibited a concentration of 31 µg/kg methylene chloride. None of the West Drum Storage Pad samples showed detectable concentrations of VOCs.

TABLE 3-1

SOIL SAMPLE SUMMARY
PPG INDUSTRIES, INC.
CIRCLEVILLE, OHIO

SEPTEMBER, 1992

Sample Number	Sample Location	Sampling Grid	Sample Date	Depth (in.)	Analytical EPA SW-846 Method	Initial Analytical Results
CV-92-330-I34	Incinerator Pad	34	9-24-92	6-12	8240	Non-Detect
CV-92-331-I34	Incinerator Pad	34	9-24-92	12-24	8240	Not Analyzed
CV-92-332-I36	Incinerator Pad	36	9-24-92	6-12	8240	Non-Detect
CV-92-333-I36	Incinerator Pad	36	9-24-92	12-24	8240	Not Analyzed
CV-92-334-I56	Incinerator Pad	56	9-24-92	6-12	8240	Non-Detect
CV-92-335-I56	Incinerator Pad	56	9-24-92	12-24	8240	Not Analyzed
CV-92-336-I113	Incinerator Pad	113	9-24-92	6-12	8240	Non-Detect
CV-92-337-I113	Incinerator Pad	113	9-24-92	12-24	8240	Not Analyzed
CV-92-338-I24	Incinerator Pad	24	9-24-92	12-24	8240	Not Analyzed
CV-92-339-I45	Incinerator Pad	45	9-24-92	12-24	8240	Not Analyzed
CV-92-524-52A	Incinerator Pad	24	10-31-92	12-24	8240	21 ppb Methylene Chloride
CV-92-525-I45	Incinerator Pad	45	10-31-92	12-24	8240	13 ppb Methylene Chloride
CV-92-340-W45	West Storage Pad	45	9-23-92	6-12	8240	Non-Detect
CV-92-341-W45	West Storage Pad	45	9-23-92	12-24	8240	Not Analyzed
CV-92-342-W51	West Storage Pad	51	9-23-92	6-12	8240	Non-Detect
CV-92-343-W51	West Storage Pad	51	9-23-92	12-24	8240	Not Analyzed
CV-92-344-W56	West Storage Pad	56	9-23-92	6-12	8240	Non-Detect
CV-92-345-W56	West Storage Pad	56	9-23-92	12-24	8240	Not Analyzed
CV-92-346-W60	West Storage Pad	60	9-23-92	6-12	8240	Non-Detect
CV-92-347-W60A	West Storage Pad	60	9-23-92	6-12	8240	Non-Detect

TABLE 3-1 (Continued)

SAMPLES COLLECTED AT THE CIRCLEVILLE, OHIO FACILITY

SEPTEMBER, 1992

Sample Number	Sample Location	Sampling Grid	Sample Date	Depth (in.)	Analytical EPA SW-846 Method	Initial Analytical Results
CV-92-359-W60A	West Storage Pad	60	9-23-92	12-24	8240	Not Analyzed
CV-92-348-W6	West Storage Pad	6	9-23-92	12-24	8240	Not Analyzed
CV-92-349-W44	West Storage Pad	44	9-23-92	12-24	8240	Not Analyzed
CV-92-W6	West Storage Pad	6	10-31-92	12-24	8240	Non-Detect
CV-92- -W44	West Storage Pad	44	10-31-92	12-24	8240	Non-Detect
CV-92-350-S79	South Storage Pad	79	9-23-92	6-12	8240	6 ppb MIBK
CV-92-351-S79	South Storage Pad	79	9-23-92	12-24	8240	Non-Detect
CV-92-354-S152	South Storage Pad	152	9-23-92	6-12	8240	Non-Detect
CV-92-355-S152	South Storage Pad	152	9-23-92	12-24	8240	Not Analyzed
CV-92-360-S146	South Storage Pad	146	9-24-92	6-12	8240	Non-Detect
CV-92-353-S146	South Storage Pad	146	9-24-92	12-24	8240	Not Analyzed
CV-92-356-S100	South Storage Pad	100	9-23-92	12-24	8240	Not Analyzed
CV-92-526-S100	South Storage Pad	100	10-31-92	12-24	8240	31 ppb Methylene Chloride

PPB: Parts Per Billion

4.0 DISCUSSION OF RESULTS

The results of the 18 samples analyzed as part of the additional sampling program conducted in September and October 1992 can be summarized as follows:

- Fourteen (14) of the samples showed nondetectable levels of VOCs, including all of the samples taken in the West Drum Storage Pad.

- The samples collected from Grid No. 79 in the South Drum Storage Pad showed 6 ppb of MIBK (which is equivalent to the method detection limit for the compound) at the 6"-12" depth, but no detectable VOCs at the 12" - 24" depth. The 12" - 24" depth sample from Grid 100 in the South Drum Storage Pad area showed detectable levels of methylene chloride.

- The 12"-24" depth samples from grids 24 and 45 in the Former Liquid Incinerator area showed detectable levels of methylene chloride.

Of the methylene chloride detected in three of the samples obtained during this sampling effort, Table 4-1 shows that the levels detected are at least an order of magnitude lower than the methylene chloride in 6"-12" samples from the same grid locations collected in 1989. These results suggest that higher concentrations at intervals deeper than 12"-24" are unlikely.

TABLE 4-1
METHYLENE CHLORIDE DATA SUMMARY
(All Concentrations in µg/kg)

Sampling Interval	Liquid Incinerator		South Drum Storage Pad
	Grid 24	Grid 45	Grid 100
6"-12" Interval (1989)	4,000	400	300
12"-24" Interval (1992)	21	13	31

Based on the analytical results reduced from this recent sampling event, the lateral extent of contamination within each of the three closure areas, (Former Liquid Incinerator Pad, West and South Drum Storage Pads) has been adequately defined. None of the chemicals of concern observed in the previous sampling event were observed in the current sampling event with the exception of methylene chloride and the data indicate that methylene chloride does not increase in concentration with depth. Furthermore, methylene chloride was only observed within the previously sampled grids.

The data obtained from this latest round of sampling will be incorporated into the existing data base for each unit to calculate site risks. Although PPG believes that Ohio EPA's guidance on risk-based RCRA unit closure is based on extremely conservative exposure scenarios, the guidance will be utilized to demonstrate that acceptable levels of risk are present at the three interim status hazardous waste management units and conditions are acceptable for closure.

APPENDIX A

ADDITIONAL SAMPLING PROGRAM CORRESPONDENCE

State of Ohio Environmental Protection Agency

Central District Office

Street Address:
2305 Westbrooke Drive, Building C
Columbus, Ohio 43228
614-771-7505 FAX 614-771-7571

Mailing Address:
P.O. Box 2198
Columbus, Ohio 43266-2198

George V. Voinovich
Governor

Donald R. Schregardus
Director

August 31, 1992

RE: Closure Appeal Settlement, Partial Closure Plan
Three drum storage areas and liquid waste incinerator
OHD 004 304 689/01-65-0063

Mr. Larry LaDage
Plant Manager
PPG Industries, Incorporated
P.O. Box 457
Circleville, Ohio 43113

Dear Mr. LaDage:

The Ohio EPA has reviewed PPG Industries' July 27, 1992 and subsequent August 7, 1992 proposals for revising the partial closure plan for the three drum storage areas and the old liquid waste incinerator site. With the changes included from the August 7, 1992 revision, the Ohio EPA finds the proposed sampling plan acceptable and approves its implementation. Please contact me prior to the start of sampling so that I may be present to observe operations and procedures. Results from the sample analysis should be submitted to this office for review and evaluation as to whether the full extent of both vertical and horizontal contamination has been determined.

If you have any questions or require further information, please feel free to contact either myself at (614) 771-7505 or Sandra Leibfritz at (614) 644-2956.

Sincerely,

John Paulian
Division of Hazardous Waste Management
Central District Office

JP/sc

cc: Chris Korleski, AGO
Sandra Leibfritz, DHWM, CO
Bryant Riley, PPG

Printed on recycled paper

PPG Industries, Inc.
Post Office Box 457 Circleville, Ohio 43113 USA

Coatings and Resins

August 7, 1992

Mr. John Paulain
Ohio EPA Central District Office
Division of Hazardous Waste Management
2305 Westbrooke Drive, Building C
Columbus, Ohio 43228

Re: Closure Plan
Three Drum Storage Areas & Liquid Incinerator
OHD004304689

Dear John:

In reference to our discussion during your site visit on Tuesday, August 4, PPG Industries amends the following item in our July 27, 1992 letter regarding the Partial Closure at the Circleville, Ohio facility:

<u>Item 3. Additional Sampling:</u>

a. INCINERATOR AREA: In order to further define the extent of contamination as determined by the previous round of sampling, additional sampling grids are added to the western boundary of the existing incinerator area grid (see attached Figure 1 Revision 1.0). Using the biased sampling approach, an additional sample will be obtained from grid 113. Sampling method and analytical protocol will be the same as described in the proposal of July 27.

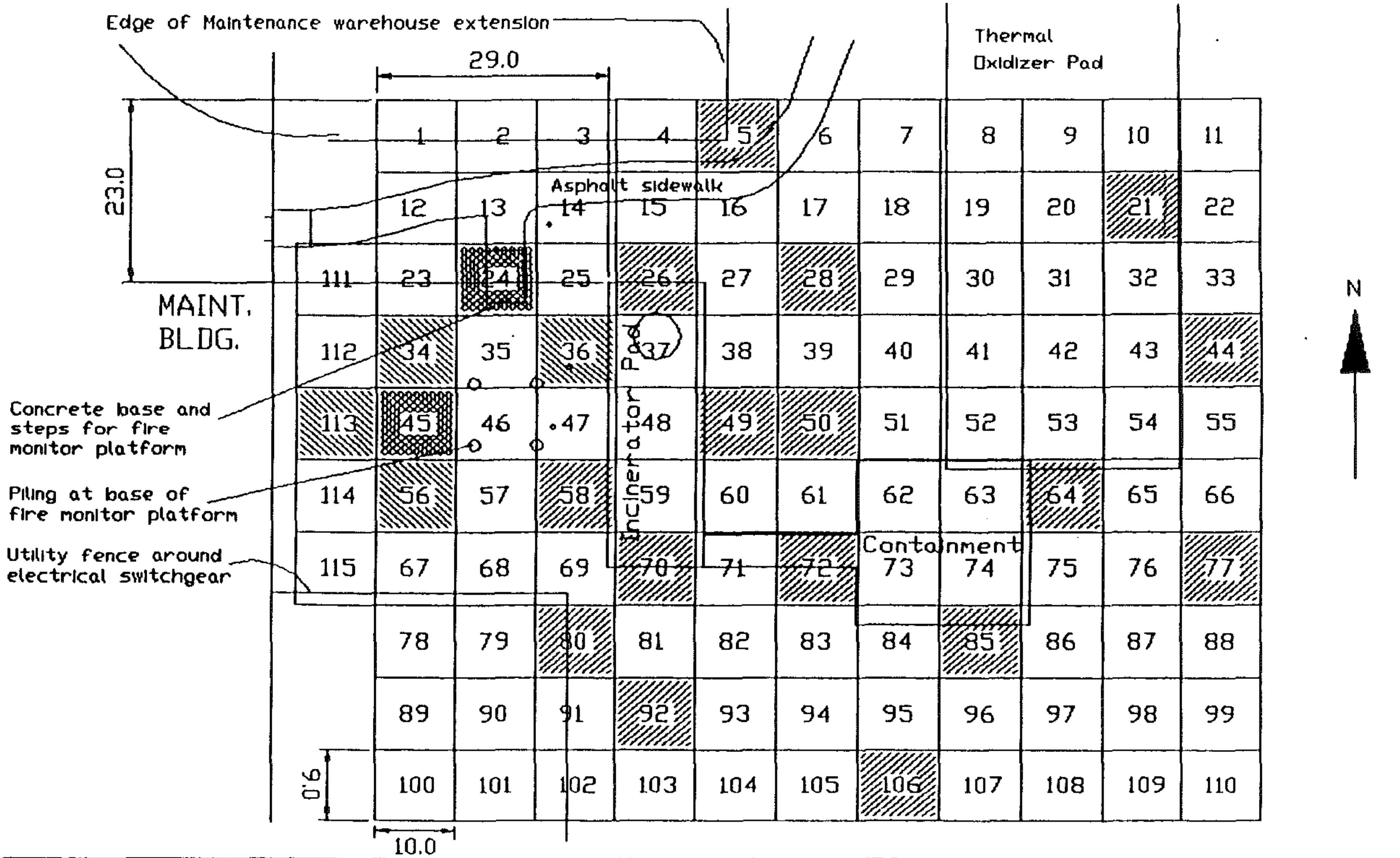
Please feel free to call if you have any questions.

Sincerely yours,

Bryant H Riley

Bryant Riley

cc: M. Broz, PPG
J. Karas, PPG
C. Waterman, Bricker & Eckler



PPG INDUSTRIES, INC.

COATINGS & RESINS DIVISION, CIRCLEVILLE, OHIO

SCALE: 1"=18'-0"

DATE: 7/20/92

BY: B. Riley

SOIL SAMPLING GRID; INCINERATOR AREA

FIGURE 1 Rev. 1.0 (8/5/92)

PPG Industries, Inc.
Post Office Box 457 Circleville, Ohio 43113 USA

Coatings and Resins

July 27, 1992

Mr. John Paulian
OhioEPA Central District Office
Division of Hazardous Waste Management
2305 Westbrooke Dive, Building C
Columbus, Ohio 43228

Re: Closure Plan
Three Drum Storage Areas & Liquid Incinerator
OHD 004 304 689

Dear Mr. Paulian:

This letter is being provided in response to the letter from you dated June 1, 1992 regarding the Partial Closure Plan for three drum storage areas and the liquid incinerator at PPG Industries, Inc. (PPG) facility in Circleville, Ohio. We offer the following responses to the items in that letter:

Item 1. PCB Contamination:

Documentation that PCB levels recorded in the south pad soils and in the incinerator soils are unrelated to RCRA activities will be included in the revised Partial Closure Plan. The Partial Closure Plan will be revised to reflect the approved responses to OEPA comments after OEPA concurrence with the contents of this letter.

Item 2. Corrective action levels:

We acknowledge your response to this item.

Item 3. Additional Sampling:

a. INCINERATOR AREA: PPG proposes to use already established sampling grids 34-36, 45-47 and 56-58 to further characterize soils to the north and west of the old incinerator (See attached Figure 1). A biased sampling approach will be used and soil samples will be obtained from grids 34, 36 and 56. Samples from these grids will be taken at depths of 6-12 inches and 12-24 inches below grade to further characterize the possible horizontal and vertical extent of contamination. The 12-24 inch samples will be analyzed only if VOCs, which are verified as not being laboratory contaminants per QA/QC procedures, are detected at the 6-12 inch depth. Samples will also be taken beneath previously sampled grids 24 and 45 at a depth of 12-24 inches below grade to characterize the possible vertical extent of contamination. (Note that, as indicated in Figure 1, a stairway is presently located in a portion of Grid 24.)

WEST PAD AREA: PPG proposes to use 16 new sampling grids (45 to 60) along the north and western boundaries of the existing grid to further characterize soils to the north and west of the west pad area (See attached Figure 2). A biased sampling approach will be used and soil samples will be obtained from grids 45, 51, 56 and 60. Samples from these grids will be taken at depths of 6-12 inches and 12-24 inches below grade to further characterize the possible horizontal and vertical extent of contamination. The 12-24 inch samples will be analyzed only if VOCs, which are verified as not being laboratory contaminants per QA/QC procedures, are detected at the 6-12 inch depth. Samples will also be taken beneath previously sampled grids 6 and 44 at a depth of 12-24 inches below grade to characterize the possible vertical extent of contamination.

SOUTH PAD AREA: A truck parking pad (concrete slab) is located directly adjacent and west of the existing grid system for the South Pad. For this reason, PPG proposes to use 5 existing grids which were not previously sampled (53, 66, 79, 92 and 105) as well as 11 new sampling grids (144 to 154) to further characterize soils to the southwest of the pad (See attached Figure 3). The new grids will include a one grid extension to the west of grids 118 and 131 and a one grid extension south of grids 131 through 138. A biased sampling approach will be used and soil samples will be obtained from grids 79, 146, and 152. Samples from these grids will be taken at depths of 6-12 inches and 12-24 inches below grade to further characterize the possible horizontal and vertical extent of contamination. The 12-24 inch samples will be analyzed only if VOCs, which are verified as not being laboratory contaminants per QA/QC procedures, are detected at the 6-12 inch depth. A sample will also be taken beneath previously sampled grid 100 at a depth of 12-24 inches below grade to characterize the possible vertical extent of contamination.

The analysis of the samples will be performed using SW-846, Method 8240. Samples will be collected by advancing a hand or power auger to the specified depth and then collecting the sample in a soil probe.

b. See proposed sampling for extent of vertical contamination under a. above.

c. If the results of the additional sampling program proposed under a. above do not result in a clear demarcation of the RCRA units of concern subject to closure activities, then PPG will provide information concerning past site operations and management practices.

d. We acknowledge your comment on this item.

e. We acknowledge your comment on this item.

PPG is requesting a response to this letter within two (2) weeks of its receipt so that sampling activities can be initiated in an expeditious manner. Note that we will inform you prior to the actual start of the sampling program so that you may be present to observe the sampling activities.

After the contents of this letter are approved and the additional sampling is completed, PPG intends to modify the Partial Closure Plan to reflect the approved responses and sampling results.

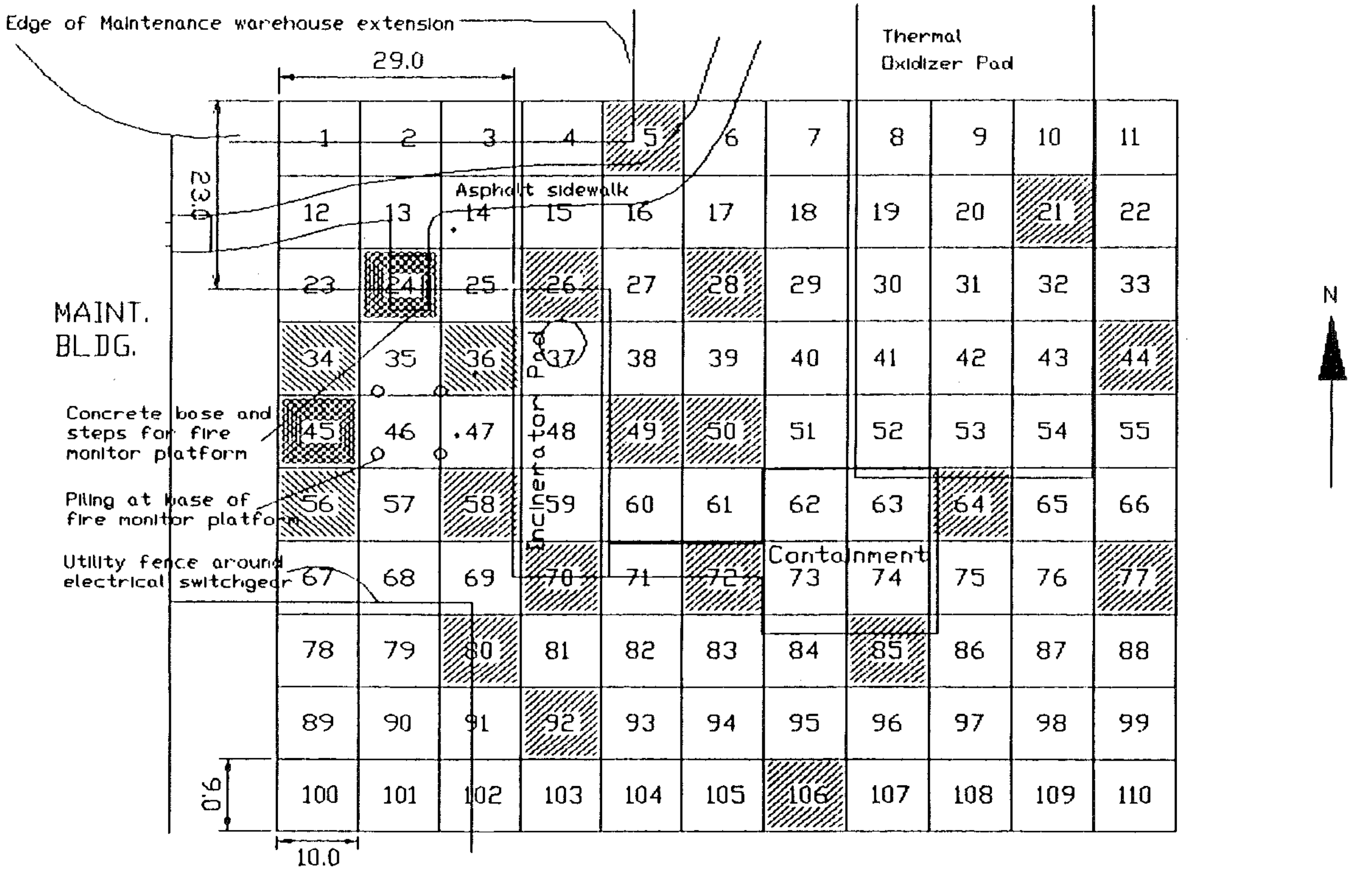
Please feel free to call if you have any questions.

Sincerely,

David W Wilder for L. LaDage

Larry LaDage
Plant Manager

cc: M. Broz, PPG/file CR 310 (1992)
J. Karas, PPG
B. Riley, PPG
C. Waterman, Bricker & Eckler



PPG INDUSTRIES, INC.

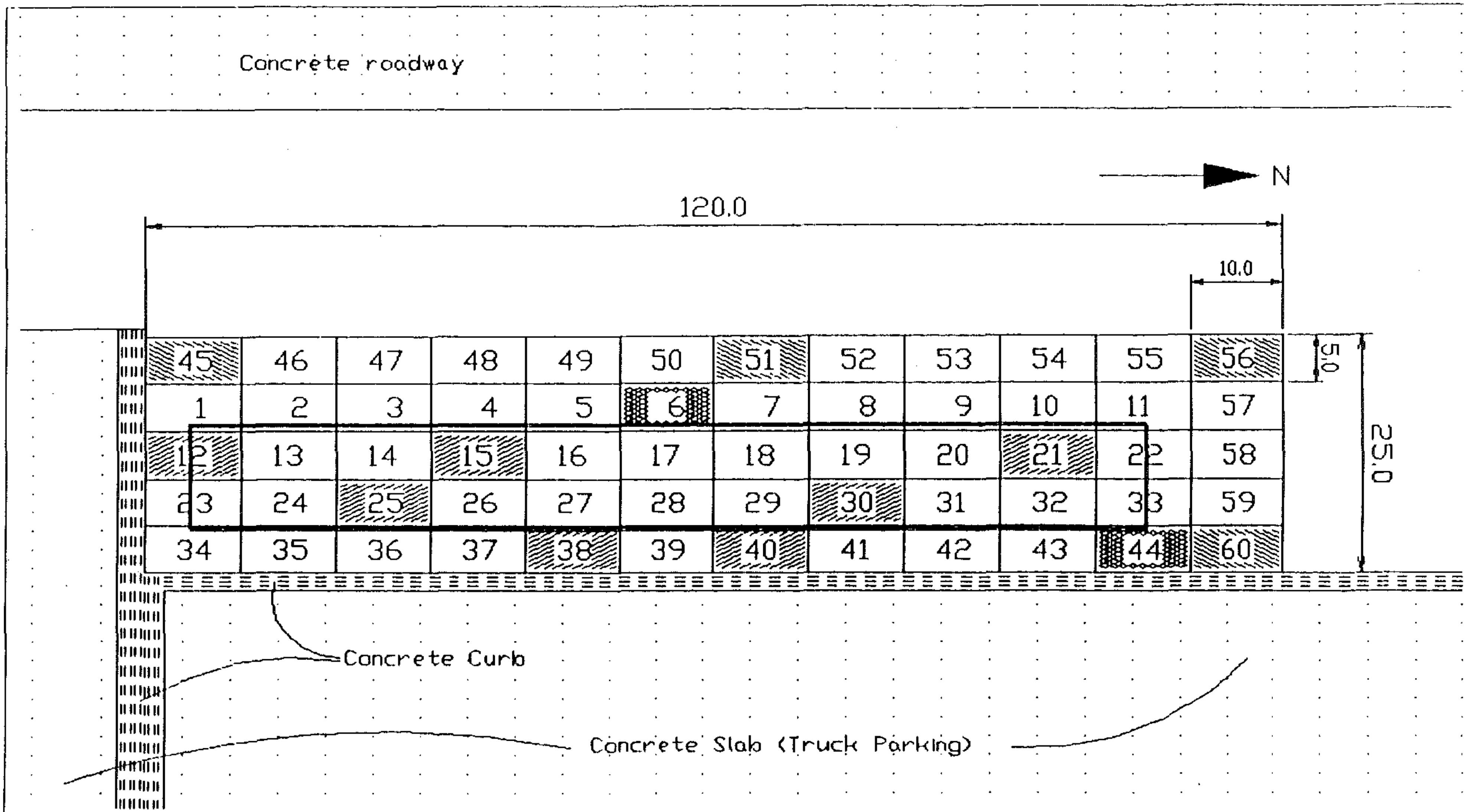
COATINGS & RESINS DIVISION, CIRCLEVILLE, OHIO

SCALE: 1"=18'-0"

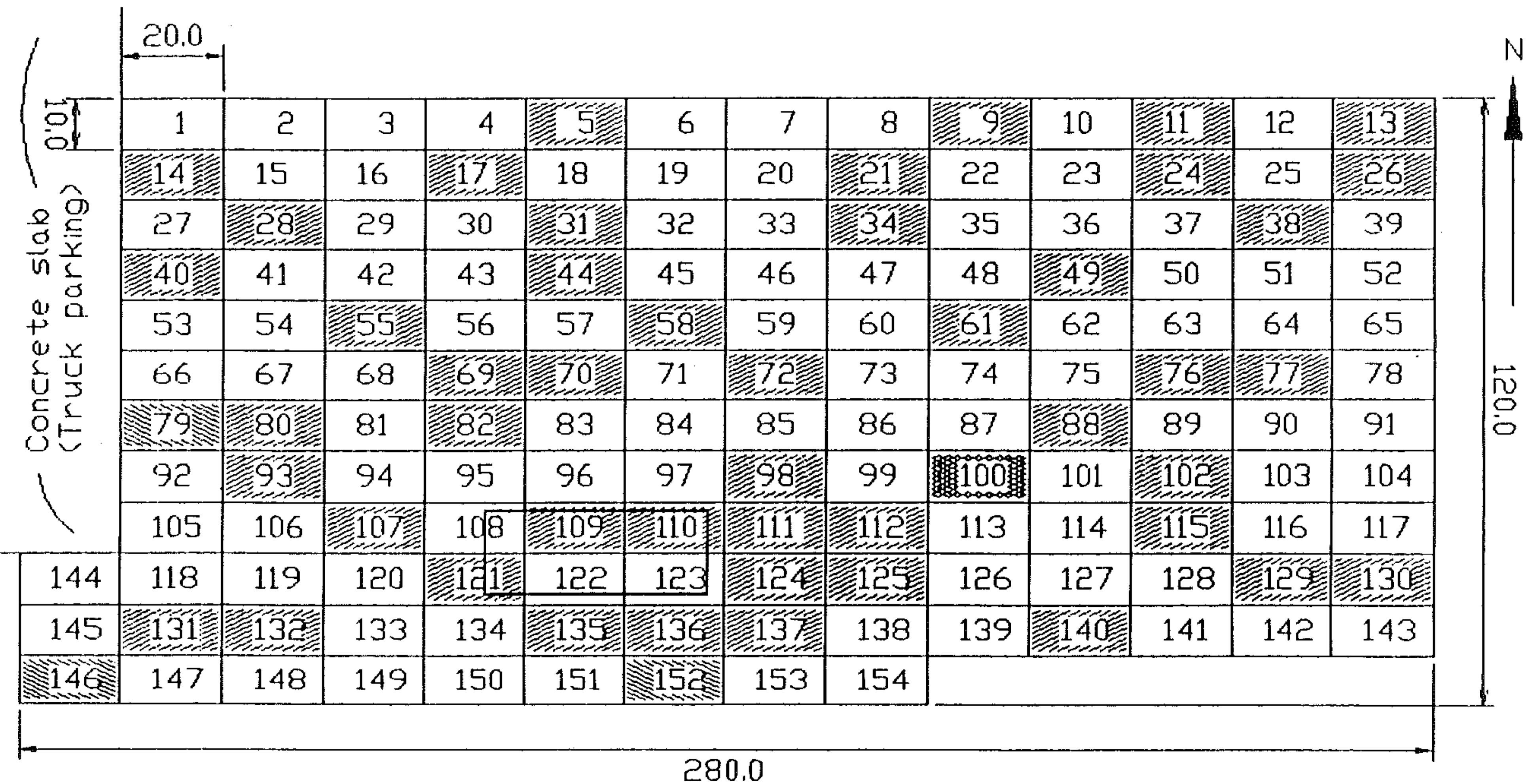
DATE: 7/20/92 BY: B. Riley

SOIL SAMPLING GRID; INCINERATOR AREA

FIGURE 1



PPG INDUSTRIES, INC.	SCALE: 1" = 15'-0"
COATINGS & RESINS DIVISION, CIRCLEVILLE, OHIO	DATE: 7/19/92 — BY: B. Riley
	FIGURE 2
SOIL SAMPLING GRID; WEST PAD CLOSURE	



PPG INDUSTRIES, INC.	SCALE: 1"=30'-0"	
COATINGS & RESINS DIVISION, CIRCLEVILLE, OHIO	DATE: 7/20/92	BY: B. Riley
	FIGURE 3	
SOIL SAMPLING GRID; SOUTH PAD CLOSURE		

APPENDIX B

LABORATORY RAW DATA

ANALYTICAL REPORT

Report To: Mr. Robert Bear
ICF Kaiser Engineers
Four Gateway Center
12th Floor
Pittsburgh, PA 15222

Project: PPG RUSH SOIL VOAs

09/30/1992

NET Job Number: 92.34112

National Environmental Testing

NET Atlantic, Inc.
Cambridge Division
12 Oak Park
Bedford, MA 01730

NET Cambridge Division

ANALYTICAL REPORT

Report To:	Reported By:
Mr. Robert Bear ICF Kaiser Engineers Four Gateway Center 12th Floor Pittsburgh, PA 15222	National Environmental Testing NET Atlantic, Incorporated Cambridge Division 12 Oak Park Bedford, MA 01730

Report Date: 09/30/1992 Collected By: ICF NET Job Number: 92.34112

Project: PPG RUSH SOIL VOAs Shipped Via: FEDEX Client P.O. No: bill to ICF dir

Job Description: PPG RUSH SOIL VOAs Airbill No: 4450798251 NET Client No: 49655

This report has been approved and certified for release by the following staff. Please feel free to call the NET Project Manager at 617-275-3535 with any questions or comments.

Edward A. Lawler

Edward A. Lawler
NET Project Manager

Michael F. Delaney

Michael F. Delaney, Ph.D.
Laboratory Director

Analytical data for the following samples are included in this data report.

SAMPLE ID	NET ID	DATE TAKEN	TIME TAKEN	DATE REC'D	MATRIX
CV-92-350-S79	67046	09/23/1992	16:45	09/24/1992	SOIL
CV-92-354-S152	67047	09/23/1992	17:10	09/24/1992	SOIL
CV-92-340-W45	67048	09/23/1992	13:38	09/24/1992	SOIL
CV-92-342-W51	67049	09/23/1992	10:50	09/24/1992	SOIL
CV-92-344-W56	67050	09/23/1992	12:19	09/24/1992	SOIL
CV-92-346-W60	67051	09/23/1992	12:50	09/24/1992	SOIL
CV-92-347-W60A	67052	09/23/1992	13:10	09/24/1992	SOIL
CV-92-351-FBW	67053	09/23/1992	13:10	09/24/1992	BLANK
CV-92-330-I34	67138	09/24/1992	09:06	09/25/1992	SOIL
CV-92-332-I36	67139	09/24/1992	09:32	09/25/1992	SOIL
CV-92-334-I56	67140	09/24/1992	08:30	09/25/1992	SOIL
CV-92-336-I113	67141	09/24/1992	08:30	09/25/1992	SOIL
CV-92-358-FBI	67142	09/24/1992	10:15	09/25/1992	BLANK
CV-92-360-S146	67143	09/24/1992	11:20	09/25/1992	SOIL

NET

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34096

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/24/1992

Sample ID: CV-92-350-S79

NET Sample No: 67046

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<5.0	ug/Kg	09/25/1992	dry
Benzene	<5.0	ug/Kg		
Bromodichloromethane	<5.0	ug/Kg		
Bromoform	<5.0	ug/Kg		
Bromomethane	<5.0	ug/Kg		
2-Butanone (MEK)	<5.0	ug/Kg		
Carbon Disulfide	<5.0	ug/Kg		
Carbon Tetrachloride	<5.0	ug/Kg		
Chlorobenzene	<5.0	ug/Kg		
Chloroethane	<5.0	ug/Kg		
2-Chloroethylvinyl ether	<5.0	ug/Kg		
Chloroform	<5.0	ug/Kg		
Chloromethane	<5.0	ug/Kg		
Dibromochloromethane	<5.0	ug/Kg		
1,2-Dichlorobenzene	<5.0	ug/Kg		
1,3-Dichlorobenzene	<5.0	ug/Kg		
1,4-Dichlorobenzene	<5.0	ug/Kg		
1,1-Dichloroethane	<5.0	ug/Kg		
1,2-Dichloroethane	<5.0	ug/Kg		
1,1-Dichloroethene	<5.0	ug/Kg		
trans-1,2-Dichloroethene	<5.0	ug/Kg		
1,2-Dichloropropane	<5.0	ug/Kg		
cis-1,3-Dichloropropene	<5.0	ug/Kg		
trans-1,3-Dichloropropene	<5.0	ug/Kg		
Ethylbenzene	<5.0	ug/Kg		
2-Hexanone	<5.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	6	ug/Kg		
Methylene Chloride	<5.0	ug/Kg		
Styrene	<5.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg		
Tetrachloroethene	<5.0	ug/Kg		
Toluene	<5.0	ug/Kg		
1,1,1-Trichloroethane	<5.0	ug/Kg		
1,1,2-Trichloroethane	<5.0	ug/Kg		
Trichloroethene	<5.0	ug/Kg		
Trichlorofluoromethane	<5.0	ug/Kg		
Vinyl Acetate	<5.0	ug/Kg		
Vinyl Chloride	<5.0	ug/Kg		
m-Xylene	<5.0	ug/Kg		
o-Xylene	<5.0	ug/Kg		
p-Xylene	<5.0	ug/Kg		

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34096

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/24/1992

Sample ID: CV-92-354-S152

NET Sample No: 67047

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<6.0	ug/Kg	09/25/1992	dry
Benzene	<6.0	ug/Kg		
Bromodichloromethane	<6.0	ug/Kg		
Bromoform	<6.0	ug/Kg		
Bromomethane	<6.0	ug/Kg		
2-Butanone (MEK)	<6.0	ug/Kg		
Carbon Disulfide	<6.0	ug/Kg		
Carbon Tetrachloride	<6.0	ug/Kg		
Chlorobenzene	<6.0	ug/Kg		
Chloroethane	<6.0	ug/Kg		
2-Chloroethylvinyl ether	<6.0	ug/Kg		
Chloroform	<6.0	ug/Kg		
Chloromethane	<6.0	ug/Kg		
Dibromochloromethane	<6.0	ug/Kg		
1,2-Dichlorobenzene	<6.0	ug/Kg		
1,3-Dichlorobenzene	<6.0	ug/Kg		
1,4-Dichlorobenzene	<6.0	ug/Kg		
1,1-Dichloroethane	<6.0	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg		
1,1-Dichloroethene	<6.0	ug/Kg		
trans-1,2-Dichloroethene	<6.0	ug/Kg		
1,2-Dichloropropane	<6.0	ug/Kg		
cis-1,3-Dichloropropene	<6.0	ug/Kg		
trans-1,3-Dichloropropene	<6.0	ug/Kg		
Ethylbenzene	<6.0	ug/Kg		
2-Hexanone	<6.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
Methylene Chloride	<6.0	ug/Kg		
Styrene	<6.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg		
Tetrachloroethene	<6.0	ug/Kg		
Toluene	<6.0	ug/Kg		
1,1,1-Trichloroethane	<6.0	ug/Kg		
1,1,2-Trichloroethane	<6.0	ug/Kg		
Trichloroethene	<6.0	ug/Kg		
Trichlorofluoromethane	<6.0	ug/Kg		
Vinyl Acetate	<6.0	ug/Kg		
Vinyl Chloride	<6.0	ug/Kg		
m-Xylene	<6.0	ug/Kg		
o-Xylene	<6.0	ug/Kg		
p-Xylene	<6.0	ug/Kg		

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34096

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/24/1992

Sample ID: CV-92-340-W45

NET Sample No: 67048

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<6.0	ug/Kg	09/25/1992	dry
Benzene	<6.0	ug/Kg		
Bromodichloromethane	<6.0	ug/Kg		
Bromoform	<6.0	ug/Kg		
Bromomethane	<6.0	ug/Kg		
2-Butanone (MEK)	<6.0	ug/Kg		
Carbon Disulfide	<6.0	ug/Kg		
Carbon Tetrachloride	<6.0	ug/Kg		
Chlorobenzene	<6.0	ug/Kg		
Chloroethane	<6.0	ug/Kg		
2-Chloroethylvinyl ether	<6.0	ug/Kg		
Chloroform	<6.0	ug/Kg		
Chloromethane	<6.0	ug/Kg		
Dibromochloromethane	<6.0	ug/Kg		
1,2-Dichlorobenzene	<6.0	ug/Kg		
1,3-Dichlorobenzene	<6.0	ug/Kg		
1,4-Dichlorobenzene	<6.0	ug/Kg		
1,1-Dichloroethane	<6.0	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg		
1,1-Dichloroethene	<6.0	ug/Kg		
trans-1,2-Dichloroethene	<6.0	ug/Kg		
1,2-Dichloropropane	<6.0	ug/Kg		
cis-1,3-Dichloropropene	<6.0	ug/Kg		
trans-1,3-Dichloropropene	<6.0	ug/Kg		
Ethylbenzene	<6.0	ug/Kg		
2-Hexanone	<6.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
Methylene Chloride	<6.0	ug/Kg		
Styrene	<6.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg		
Tetrachloroethene	<6.0	ug/Kg		
Toluene	<6.0	ug/Kg		
1,1,1-Trichloroethane	<6.0	ug/Kg		
1,1,2-Trichloroethane	<6.0	ug/Kg		
Trichloroethene	<6.0	ug/Kg		
Trichlorofluoromethane	<6.0	ug/Kg		
Vinyl Acetate	<6.0	ug/Kg		
Vinyl Chloride	<6.0	ug/Kg		
m-Xylene	<6.0	ug/Kg		
o-Xylene	<6.0	ug/Kg		
p-Xylene	<6.0	ug/Kg		

NET

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34096

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/24/1992

Sample ID: CV-92-342-W51

NET Sample No: 67049

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<6.0	ug/Kg	09/25/1992	dry
Benzene	<6.0	ug/Kg		
Bromodichloromethane	<6.0	ug/Kg		
Bromoform	<6.0	ug/Kg		
Bromomethane	<6.0	ug/Kg		
2-Butanone (MEK)	<6.0	ug/Kg		
Carbon Disulfide	<6.0	ug/Kg		
Carbon Tetrachloride	<6.0	ug/Kg		
Chlorobenzene	<6.0	ug/Kg		
Chloroethane	<6.0	ug/Kg		
2-Chloroethylvinyl ether	<6.0	ug/Kg		
Chloroform	<6.0	ug/Kg		
Chloromethane	<6.0	ug/Kg		
Dibromochloromethane	<6.0	ug/Kg		
1,2-Dichlorobenzene	<6.0	ug/Kg		
1,3-Dichlorobenzene	<6.0	ug/Kg		
1,4-Dichlorobenzene	<6.0	ug/Kg		
1,1-Dichloroethane	<6.0	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg		
1,1-Dichloroethene	<6.0	ug/Kg		
trans-1,2-Dichloroethene	<6.0	ug/Kg		
1,2-Dichloropropane	<6.0	ug/Kg		
cis-1,3-Dichloropropene	<6.0	ug/Kg		
trans-1,3-Dichloropropene	<6.0	ug/Kg		
Ethylbenzene	<6.0	ug/Kg		
2-Hexanone	<6.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
Methylene Chloride	<6.0	ug/Kg		
Styrene	<6.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg		
Tetrachloroethene	<6.0	ug/Kg		
Toluene	<6.0	ug/Kg		
1,1,1-Trichloroethane	<6.0	ug/Kg		
1,1,2-Trichloroethane	<6.0	ug/Kg		
Trichloroethene	<6.0	ug/Kg		
Trichlorofluoromethane	<6.0	ug/Kg		
Vinyl Acetate	<6.0	ug/Kg		
Vinyl Chloride	<6.0	ug/Kg		
m-Xylene	<6.0	ug/Kg		
o-Xylene	<6.0	ug/Kg		
p-Xylene	<6.0	ug/Kg		

NET

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34096

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/24/1992

Sample ID: CV-92-344-W56

NET Sample No: 67050

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<5.0	ug/Kg	09/25/1992	dry
Benzene	<5.0	ug/Kg		
Bromodichloromethane	<5.0	ug/Kg		
Bromoform	<5.0	ug/Kg		
Bromomethane	<5.0	ug/Kg		
2-Butanone (MEK)	<5.0	ug/Kg		
Carbon Disulfide	<5.0	ug/Kg		
Carbon Tetrachloride	<5.0	ug/Kg		
Chlorobenzene	<5.0	ug/Kg		
Chloroethane	<5.0	ug/Kg		
2-Chloroethylvinyl ether	<5.0	ug/Kg		
Chloroform	<5.0	ug/Kg		
Chloromethane	<5.0	ug/Kg		
Dibromochloromethane	<5.0	ug/Kg		
1,2-Dichlorobenzene	<5.0	ug/Kg		
1,3-Dichlorobenzene	<5.0	ug/Kg		
1,4-Dichlorobenzene	<5.0	ug/Kg		
1,1-Dichloroethane	<5.0	ug/Kg		
1,2-Dichloroethane	<5.0	ug/Kg		
1,1-Dichloroethene	<5.0	ug/Kg		
trans-1,2-Dichloroethene	<5.0	ug/Kg		
1,2-Dichloropropane	<5.0	ug/Kg		
cis-1,3-Dichloropropene	<5.0	ug/Kg		
trans-1,3-Dichloropropene	<5.0	ug/Kg		
Ethylbenzene	<5.0	ug/Kg		
2-Hexanone	<5.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<5.0	ug/Kg		
Methylene Chloride	<5.0	ug/Kg		
Styrene	<5.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg		
Tetrachloroethene	<5.0	ug/Kg		
Toluene	<5.0	ug/Kg		
1,1,1-Trichloroethane	<5.0	ug/Kg		
1,1,2-Trichloroethane	<5.0	ug/Kg		
Trichloroethene	<5.0	ug/Kg		
Trichlorofluoromethane	<5.0	ug/Kg		
Vinyl Acetate	<5.0	ug/Kg		
Vinyl Chloride	<5.0	ug/Kg		
m-Xylene	<5.0	ug/Kg		
o-Xylene	<5.0	ug/Kg		
p-Xylene	<5.0	ug/Kg		

NET

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34096

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/24/1992

Sample ID: CV-92-346-W60

NET Sample No: 67051

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<6.0	ug/Kg	09/25/1992	dry
Benzene	<6.0	ug/Kg		
Bromodichloromethane	<6.0	ug/Kg		
Bromoform	<6.0	ug/Kg		
Bromomethane	<6.0	ug/Kg		
2-Butanone (MEK)	<6.0	ug/Kg		
Carbon Disulfide	<6.0	ug/Kg		
Carbon Tetrachloride	<6.0	ug/Kg		
Chlorobenzene	<6.0	ug/Kg		
Chloroethane	<6.0	ug/Kg		
2-Chloroethylvinyl ether	<6.0	ug/Kg		
Chloroform	<6.0	ug/Kg		
Chloromethane	<6.0	ug/Kg		
Dibromochloromethane	<6.0	ug/Kg		
1,2-Dichlorobenzene	<6.0	ug/Kg		
1,3-Dichlorobenzene	<6.0	ug/Kg		
1,4-Dichlorobenzene	<6.0	ug/Kg		
1,1-Dichloroethane	<6.0	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg		
1,1-Dichloroethene	<6.0	ug/Kg		
trans-1,2-Dichloroethene	<6.0	ug/Kg		
1,2-Dichloropropane	<6.0	ug/Kg		
cis-1,3-Dichloropropene	<6.0	ug/Kg		
trans-1,3-Dichloropropene	<6.0	ug/Kg		
Ethylbenzene	<6.0	ug/Kg		
2-Hexanone	<6.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
Methylene Chloride	<6.0	ug/Kg		
Styrene	<6.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg		
Tetrachloroethene	<6.0	ug/Kg		
Toluene	<6.0	ug/Kg		
1,1,1-Trichloroethane	<6.0	ug/Kg		
1,1,2-Trichloroethane	<6.0	ug/Kg		
Trichloroethene	<6.0	ug/Kg		
Trichlorofluoromethane	<6.0	ug/Kg		
Vinyl Acetate	<6.0	ug/Kg		
Vinyl Chloride	<6.0	ug/Kg		
m-Xylene	<6.0	ug/Kg		
o-Xylene	<6.0	ug/Kg		
p-Xylene	<6.0	ug/Kg		

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34096

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/24/1992

Sample ID: CV-92-347-W60A

NET Sample No: 67052

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<5.0	ug/Kg	09/25/1992	dry
Benzene	<5.0	ug/Kg		
Bromodichloromethane	<5.0	ug/Kg		
Bromoform	<5.0	ug/Kg		
Bromomethane	<5.0	ug/Kg		
2-Butanone (MEK)	<5.0	ug/Kg		
Carbon Disulfide	<5.0	ug/Kg		
Carbon Tetrachloride	<5.0	ug/Kg		
Chlorobenzene	<5.0	ug/Kg		
Chloroethane	<5.0	ug/Kg		
2-Chloroethylvinyl ether	<5.0	ug/Kg		
Chloroform	<5.0	ug/Kg		
Chloromethane	<5.0	ug/Kg		
Dibromochloromethane	<5.0	ug/Kg		
1,2-Dichlorobenzene	<5.0	ug/Kg		
1,3-Dichlorobenzene	<5.0	ug/Kg		
1,4-Dichlorobenzene	<5.0	ug/Kg		
1,1-Dichloroethane	<5.0	ug/Kg		
1,2-Dichloroethane	<5.0	ug/Kg		
1,1-Dichloroethene	<5.0	ug/Kg		
trans-1,2-Dichloroethene	<5.0	ug/Kg		
1,2-Dichloropropane	<5.0	ug/Kg		
cis-1,3-Dichloropropene	<5.0	ug/Kg		
trans-1,3-Dichloropropene	<5.0	ug/Kg		
Ethylbenzene	<5.0	ug/Kg		
2-Hexanone	<5.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<5.0	ug/Kg		
Methylene Chloride	<5.0	ug/Kg		
Styrene	<5.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg		
Tetrachloroethene	<5.0	ug/Kg		
Toluene	<5.0	ug/Kg		
1,1,1-Trichloroethane	<5.0	ug/Kg		
1,1,2-Trichloroethane	<5.0	ug/Kg		
Trichloroethene	<5.0	ug/Kg		
Trichlorofluoromethane	<5.0	ug/Kg		
Vinyl Acetate	<5.0	ug/Kg		
Vinyl Chloride	<5.0	ug/Kg		
m-Xylene	<5.0	ug/Kg		
o-Xylene	<5.0	ug/Kg		
p-Xylene	<5.0	ug/Kg		

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34096

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/24/1992

Sample ID: CV-92-351-FBW

NET Sample No: 67053

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 624 AQ				
Acetone	<5.0	ug/L	09/30/1992	mfw
Benzene	<5.0	ug/L		
Bromodichloromethane	<5.0	ug/L		
Bromoform	<5.0	ug/L		
Bromomethane	<5.0	ug/L		
2-Butanone (MEK)	<5.0	ug/L		
Carbon Disulfide	<5.0	ug/L		
Carbon Tetrachloride	<5.0	ug/L		
Chlorobenzene	<5.0	ug/L		
Chloroethane	<5.0	ug/L		
2-Chloroethylvinyl ether	<5.0	ug/L		
Chloroform	<5.0	ug/L		
Chloromethane	<5.0	ug/L		
Dibromochloromethane	<5.0	ug/L		
1,2-Dichlorobenzene	<5.0	ug/L		
1,3-Dichlorobenzene	<5.0	ug/L		
1,4-Dichlorobenzene	<5.0	ug/L		
1,1-Dichloroethane	<5.0	ug/L		
1,2-Dichloroethane	<5.0	ug/L		
1,1-Dichloroethene	<5.0	ug/L		
trans-1,2-Dichloroethene	<5.0	ug/L		
1,2-Dichloropropane	<5.0	ug/L		
cis-1,3-Dichloropropene	<5.0	ug/L		
trans-1,3-Dichloropropene	<5.0	ug/L		
Ethylbenzene	<5.0	ug/L		
2-Hexanone	<5.0	ug/L		
4-Methyl-2-pentanone (MIBK	<5.0	ug/L		
Methylene Chloride	<5.0	ug/L		
Styrene	<5.0	ug/L		
1,1,2,2-Tetrachloroethane	<5.0	ug/L		
Tetrachloroethene	<5.0	ug/L		
Toluene	<5.0	ug/L		
1,1,1-Trichloroethane	<5.0	ug/L		
1,1,2-Trichloroethane	<5.0	ug/L		
Trichloroethene	<5.0	ug/L		
Trichlorofluoromethane	<5.0	ug/L		
Vinyl Acetate	<5.0	ug/L		
Vinyl Chloride	<5.0	ug/L		
m-Xylene	<5.0	ug/L		
o-Xylene	<5.0	ug/L		
p-Xylene	<5.0	ug/L		

NET

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34112

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/25/1992

Sample ID: CV-92-330-134

NET Sample No: 67138

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<6.0	ug/Kg	09/29/1992	dry
Benzene	<6.0	ug/Kg		
Bromodichloromethane	<6.0	ug/Kg		
Bromoform	<6.0	ug/Kg		
Bromomethane	<6.0	ug/Kg		
2-Butanone (MEK)	<6.0	ug/Kg		
Carbon Disulfide	<6.0	ug/Kg		
Carbon Tetrachloride	<6.0	ug/Kg		
Chlorobenzene	<6.0	ug/Kg		
Chloroethane	<6.0	ug/Kg		
2-Chloroethylvinyl ether	<6.0	ug/Kg		
Chloroform	<6.0	ug/Kg		
Chloromethane	<6.0	ug/Kg		
Dibromochloromethane	<6.0	ug/Kg		
1,2-Dichlorobenzene	<6.0	ug/Kg		
1,3-Dichlorobenzene	<6.0	ug/Kg		
1,4-Dichlorobenzene	<6.0	ug/Kg		
1,1-Dichloroethane	<6.0	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg		
1,1-Dichloroethene	<6.0	ug/Kg		
trans-1,2-Dichloroethene	<6.0	ug/Kg		
1,2-Dichloropropane	<6.0	ug/Kg		
cis-1,3-Dichloropropene	<6.0	ug/Kg		
trans-1,3-Dichloropropene	<6.0	ug/Kg		
Ethylbenzene	<6.0	ug/Kg		
2-Hexanone	<6.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
Methylene Chloride	<6.0	ug/Kg		
Styrene	<6.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg		
Tetrachloroethene	<6.0	ug/Kg		
Toluene	<6.0	ug/Kg		
1,1,1-Trichloroethane	<6.0	ug/Kg		
1,1,2-Trichloroethane	<6.0	ug/Kg		
Trichloroethene	<6.0	ug/Kg		
Trichlorofluoromethane	<6.0	ug/Kg		
Vinyl Acetate	<6.0	ug/Kg		
Vinyl Chloride	<6.0	ug/Kg		
m-Xylene	<6.0	ug/Kg		
o-Xylene	<6.0	ug/Kg		
p-Xylene	<6.0	ug/Kg		

NET

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34112

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/25/1992

Sample ID: CV-92-332-136

NET Sample No: 67139

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<6.0	ug/Kg	09/29/1992	dry
Benzene	<6.0	ug/Kg		
Bromodichloromethane	<6.0	ug/Kg		
Bromoform	<6.0	ug/Kg		
Bromomethane	<6.0	ug/Kg		
2-Butanone (MEK)	<6.0	ug/Kg		
Carbon Disulfide	<6.0	ug/Kg		
Carbon Tetrachloride	<6.0	ug/Kg		
Chlorobenzene	<6.0	ug/Kg		
Chloroethane	<6.0	ug/Kg		
2-Chloroethylvinyl ether	<6.0	ug/Kg		
Chloroform	<6.0	ug/Kg		
Chloromethane	<6.0	ug/Kg		
Dibromochloromethane	<6.0	ug/Kg		
1,2-Dichlorobenzene	<6.0	ug/Kg		
1,3-Dichlorobenzene	<6.0	ug/Kg		
1,4-Dichlorobenzene	<6.0	ug/Kg		
1,1-Dichloroethane	<6.0	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg		
1,1-Dichloroethene	<6.0	ug/Kg		
trans-1,2-Dichloroethene	<6.0	ug/Kg		
1,2-Dichloropropane	<6.0	ug/Kg		
cis-1,3-Dichloropropene	<6.0	ug/Kg		
trans-1,3-Dichloropropene	<6.0	ug/Kg		
Ethylbenzene	<6.0	ug/Kg		
2-Hexanone	<6.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
Methylene Chloride	<6.0	ug/Kg		
Styrene	<6.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg		
Tetrachloroethene	<6.0	ug/Kg		
Toluene	<6.0	ug/Kg		
1,1,1-Trichloroethane	<6.0	ug/Kg		
1,1,2-Trichloroethane	<6.0	ug/Kg		
Trichloroethene	<6.0	ug/Kg		
Trichlorofluoromethane	<6.0	ug/Kg		
Vinyl Acetate	<6.0	ug/Kg		
Vinyl Chloride	<6.0	ug/Kg		
m-Xylene	<6.0	ug/Kg		
o-Xylene	<6.0	ug/Kg		
p-Xylene	<6.0	ug/Kg		

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34112

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/25/1992

Sample ID: CV-92-334-156

NET Sample No: 67140

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<6.0	ug/Kg	09/29/1992	dry
Benzene	<6.0	ug/Kg		
Bromodichloromethane	<6.0	ug/Kg		
Bromoform	<6.0	ug/Kg		
Bromomethane	<6.0	ug/Kg		
2-Butanone (MEK)	<6.0	ug/Kg		
Carbon Disulfide	<6.0	ug/Kg		
Carbon Tetrachloride	<6.0	ug/Kg		
Chlorobenzene	<6.0	ug/Kg		
Chloroethane	<6.0	ug/Kg		
2-Chloroethylvinyl ether	<6.0	ug/Kg		
Chloroform	<6.0	ug/Kg		
Chloromethane	<6.0	ug/Kg		
Dibromochloromethane	<6.0	ug/Kg		
1,2-Dichlorobenzene	<6.0	ug/Kg		
1,3-Dichlorobenzene	<6.0	ug/Kg		
1,4-Dichlorobenzene	<6.0	ug/Kg		
1,1-Dichloroethane	<6.0	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg		
1,1-Dichloroethene	<6.0	ug/Kg		
trans-1,2-Dichloroethene	<6.0	ug/Kg		
1,2-Dichloropropane	<6.0	ug/Kg		
cis-1,3-Dichloropropene	<6.0	ug/Kg		
trans-1,3-Dichloropropene	<6.0	ug/Kg		
Ethylbenzene	<6.0	ug/Kg		
2-Hexanone	<6.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
Methylene Chloride	<6.0	ug/Kg		
Styrene	<6.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg		
Tetrachloroethene	<6.0	ug/Kg		
Toluene	<6.0	ug/Kg		
1,1,1-Trichloroethane	<6.0	ug/Kg		
1,1,2-Trichloroethane	<6.0	ug/Kg		
Trichloroethene	<6.0	ug/Kg		
Trichlorofluoromethane	<6.0	ug/Kg		
Vinyl Acetate	<6.0	ug/Kg		
Vinyl Chloride	<6.0	ug/Kg		
m-Xylene	<6.0	ug/Kg		
o-Xylene	<6.0	ug/Kg		
p-Xylene	<6.0	ug/Kg		

NET

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34112

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/25/1992

Sample ID: CV-92-336-I113

NET Sample No: 67141

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<5.0	ug/Kg	09/29/1992	dry
Benzene	<5.0	ug/Kg		
Bromodichloromethane	<5.0	ug/Kg		
Bromoform	<5.0	ug/Kg		
Bromomethane	<5.0	ug/Kg		
2-Butanone (MEK)	<5.0	ug/Kg		
Carbon Disulfide	<5.0	ug/Kg		
Carbon Tetrachloride	<5.0	ug/Kg		
Chlorobenzene	<5.0	ug/Kg		
Chloroethane	<5.0	ug/Kg		
2-Chloroethylvinyl ether	<5.0	ug/Kg		
Chloroform	<5.0	ug/Kg		
Chloromethane	<5.0	ug/Kg		
Dibromochloromethane	<5.0	ug/Kg		
1,2-Dichlorobenzene	<5.0	ug/Kg		
1,3-Dichlorobenzene	<5.0	ug/Kg		
1,4-Dichlorobenzene	<5.0	ug/Kg		
1,1-Dichloroethane	<5.0	ug/Kg		
1,2-Dichloroethane	<5.0	ug/Kg		
1,1-Dichloroethene	<5.0	ug/Kg		
trans-1,2-Dichloroethene	<5.0	ug/Kg		
1,2-Dichloropropane	<5.0	ug/Kg		
cis-1,3-Dichloropropene	<5.0	ug/Kg		
trans-1,3-Dichloropropene	<5.0	ug/Kg		
Ethylbenzene	<5.0	ug/Kg		
2-Hexanone	<5.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<5.0	ug/Kg		
Methylene Chloride	<5.0	ug/Kg		
Styrene	<5.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg		
Tetrachloroethene	<5.0	ug/Kg		
Toluene	<5.0	ug/Kg		
1,1,1-Trichloroethane	<5.0	ug/Kg		
1,1,2-Trichloroethane	<5.0	ug/Kg		
Trichloroethene	<5.0	ug/Kg		
Trichlorofluoromethane	<5.0	ug/Kg		
Vinyl Acetate	<5.0	ug/Kg		
Vinyl Chloride	<5.0	ug/Kg		
m-Xylene	<5.0	ug/Kg		
o-Xylene	<5.0	ug/Kg		
p-Xylene	<5.0	ug/Kg		

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34112

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/25/1992

Sample ID: CV-92-358-FBI

NET Sample No: 67142

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 624 AQ				
Acetone	<5.0	ug/L	09/29/1992	cdl
Benzene	<5.0	ug/L		
Bromodichloromethane	<5.0	ug/L		
Bromoform	<5.0	ug/L		
Bromomethane	<5.0	ug/L		
2-Butanone (MEK)	<5.0	ug/L		
Carbon Disulfide	<5.0	ug/L		
Carbon Tetrachloride	<5.0	ug/L		
Chlorobenzene	<5.0	ug/L		
Chloroethane	<5.0	ug/L		
2-Chloroethylvinyl ether	<5.0	ug/L		
Chloroform	<5.0	ug/L		
Chloromethane	<5.0	ug/L		
Dibromochloromethane	<5.0	ug/L		
1,2-Dichlorobenzene	<5.0	ug/L		
1,3-Dichlorobenzene	<5.0	ug/L		
1,4-Dichlorobenzene	<5.0	ug/L		
1,1-Dichloroethane	<5.0	ug/L		
1,2-Dichloroethane	<5.0	ug/L		
1,1-Dichloroethene	<5.0	ug/L		
trans-1,2-Dichloroethene	<5.0	ug/L		
1,2-Dichloropropane	<5.0	ug/L		
cis-1,3-Dichloropropene	<5.0	ug/L		
trans-1,3-Dichloropropene	<5.0	ug/L		
Ethylbenzene	<5.0	ug/L		
2-Hexanone	<5.0	ug/L		
4-Methyl-2-pentanone (MIBK	<5.0	ug/L		
Methylene Chloride	<5.0	ug/L		
Styrene	<5.0	ug/L		
1,1,2,2-Tetrachloroethane	<5.0	ug/L		
Tetrachloroethene	<5.0	ug/L		
Toluene	<5.0	ug/L		
1,1,1-Trichloroethane	<5.0	ug/L		
1,1,2-Trichloroethane	<5.0	ug/L		
Trichloroethene	<5.0	ug/L		
Trichlorofluoromethane	<5.0	ug/L		
Vinyl Acetate	<5.0	ug/L		
Vinyl Chloride	<5.0	ug/L		
m-Xylene	<5.0	ug/L		
o-Xylene	<5.0	ug/L		
p-Xylene	<5.0	ug/L		

NET

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34112

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/25/1992

Sample ID: CV-92-360-S146

NET Sample No: 67143

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<5.0	ug/Kg	09/29/1992	dry
Benzene	<5.0	ug/Kg		
Bromodichloromethane	<5.0	ug/Kg		
Bromoform	<5.0	ug/Kg		
Bromomethane	<5.0	ug/Kg		
2-Butanone (MEK)	<5.0	ug/Kg		
Carbon Disulfide	<5.0	ug/Kg		
Carbon Tetrachloride	<5.0	ug/Kg		
Chlorobenzene	<5.0	ug/Kg		
Chloroethane	<5.0	ug/Kg		
2-Chloroethylvinyl ether	<5.0	ug/Kg		
Chloroform	<5.0	ug/Kg		
Chloromethane	<5.0	ug/Kg		
Dibromochloromethane	<5.0	ug/Kg		
1,2-Dichlorobenzene	<5.0	ug/Kg		
1,3-Dichlorobenzene	<5.0	ug/Kg		
1,4-Dichlorobenzene	<5.0	ug/Kg		
1,1-Dichloroethane	<5.0	ug/Kg		
1,2-Dichloroethane	<5.0	ug/Kg		
1,1-Dichloroethene	<5.0	ug/Kg		
trans-1,2-Dichloroethene	<5.0	ug/Kg		
1,2-Dichloropropane	<5.0	ug/Kg		
cis-1,3-Dichloropropene	<5.0	ug/Kg		
trans-1,3-Dichloropropene	<5.0	ug/Kg		
Ethylbenzene	<5.0	ug/Kg		
2-Hexanone	<5.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<5.0	ug/Kg		
Methylene Chloride	<5.0	ug/Kg		
Styrene	<5.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg		
Tetrachloroethene	<5.0	ug/Kg		
Toluene	<5.0	ug/Kg		
1,1,1-Trichloroethane	<5.0	ug/Kg		
1,1,2-Trichloroethane	<5.0	ug/Kg		
Trichloroethene	<5.0	ug/Kg		
Trichlorofluoromethane	<5.0	ug/Kg		
Vinyl Acetate	<5.0	ug/Kg		
Vinyl Chloride	<5.0	ug/Kg		
m-Xylene	<5.0	ug/Kg		
o-Xylene	<5.0	ug/Kg		
p-Xylene	<5.0	ug/Kg		

NET

NET Cambridge Division

QUALITY CONTROL DATA

Client: ICF Kaiser Engineers NET Job No: 92.34096

Project: PPG RUSH SOIL VOAs Report Date: 09/30/1992

Surrogate Standard Percent Recovery

Abbreviated Surrogate Standard Names:

SS1	SS2	SS3	SS4	SS5	SS6	SS7	SS8	SS9	SS10	SS11	SS12
Bromofl	1,2-Dic	Toluene	Bromofl	1,2-Dic	Toluene						

						Percent Recovery								
Sample ID	NET ID	Matrix	SS1	SS2	SS3	SS4	SS5	SS6	SS7	SS8	SS9	SS10	SS11	SS12
CV-92-350-S79	67046	SOIL				87	83	107						
CV-92-354-S152	67047	SOIL				80	76	117						
CV-92-340-W45	67048	SOIL				95	88	112						
CV-92-342-W51	67049	SOIL				87	84	128						
CV-92-344-W56	67050	SOIL				75	76	109						
CV-92-346-W60	67051	SOIL				78	74	107						
CV-92-347-W60A	67052	SOIL				94	91	126						
CV-92-351-FBW	67053	BLANK	104	99	106									
CV-92-330-I34	67138	SOIL				87	84	107						
CV-92-332-I36	67139	SOIL				81	83	109						
CV-92-334-I56	67140	SOIL				82	82	105						
CV-92-336-I113	67141	SOIL				85	78	104						
CV-92-358-FBI	67142	BLANK	101	100	106									
CV-92-360-S146	67143	SOIL				87	82	102						

Notes:

NR - This surrogate standard is Not Required. Other versions of this test method may use this surrogate standard.

Dil - This surrogate standard was diluted to below detectable levels due to concentrations of analytes in this sample.

Complete Surrogate Standard Names Listed by Analysis:

Pesticide Surrogate Standards:

Decachl = Decachlorobiphenyl Dibutyl = Dibutylchlorendate Tetrach = Tetrachloro-m-xylene

Volatile Surrogate Standards:

Bromofl = Bromofluorobenzene 1,2-Dichl = 1,2-Dichloroethane-d4 Toluene = Toluene-d8

Drinking Water Method 524 1,2-Dichl = 1,2-Dichlorobenzene-d4

Semivolatlile Surrogate Standards:

2-Fluor (1st) = 2-Fluorobiphenyl Phenol- = Phenol-d6 2,4,6-T = 2,4,6-Tribromophenol

2-Fluor (2nd) = 2-Fluorophenol Nitrobe = Nitrobenzene-d5 p-Terph = p-Terphenyl

Herbicides Surrogate Standard:

2,4-Dic = 2,4-Dichlorophenyl acetic acid

Petroleum Hydrocarbon Fingerprint Surrogate Standard:

2-Fluor = 2-Fluorobiphenyl para-Te = para-Terphynyl

NET ATLANTIC, INC. CAMBRIDGE DIVISION
DATA WORKSHEET METHOD BLANK

DATE/TIME:920825 11:46 ANALYST:JP INSTRUMENT:HP5970
BLANK FILE: >H4112
MATRIX: SOIL ✓ AQUEOUS ______ MEDIUM LEVEL _____.

TEST	COMPOUND NAME	RESULT UG/L	RESULT UG/KG	REPORTING LIMIT UG/L	REPORTING LIMIT UG/KG
56644	CHLOROMETHANE	......	ND	5	
56628	BROMOMETHANE	......		5	
56692	VINYL CHLORIDE	......		5	
56638	CHLOROETHANE	......		5	
56689	TRICHLOROFLUOROMETHANE	......		5	
56672	METHYLENE CHLORIDE	......		5	
56620	ACETONE	......		5	
56632	CARBON DISULFIDE	......		5	
56652	1,1-DICHLOROETHANE	......		5	
56656	1,1-DICHLOROETHENE	......		5	
56658	trans-1,2-DICHLOROETHENE	......		5	
	cis-1,2-DICHLOROETHENE			5	
56642	CHLOROFORM	......		5	
56654	1,2-DICHLOROETHANE	......		5	
56630	2-BUTANONE (MEK)	......		5	
56682	1,1,1-TRICHLOROETHANE	......		5	
56634	CARBON TETRACHLORIDE	......		5	
55690	VINYL ACETATE	......		5	
56624	BROMODICHLOROMETHANE	......		5	
56660	1,2-DICHLOROPROPANE	......		5	
56686	TRICHLOROETHENE	......		5	
56646	DIBROMOCHLOROMETHANE	......		5	
56684	1,1,2-TRICHLOROETHANE	......		5	
56622	BENZENE	......		5	
56664	trans-1,3-DICHLOROPROPENE	......		5	
	cis-1,3-DICHLOROPROPENE	......		5	
56540	2-CHLOROETHYLVINYL ETHER	......		5	
56626	BROMOFORM	......		5	
56670	4-METHYL-2-PENTANONE	......		5	
56662	2-HEXANONE	......		5	
56678	TETRACHLOROETHENE	......		5	
56676	1,1,2,2-TETRACHLOROETHANE	......		5	
56680	TOLUENE	......		5	
56638	CHLOROBENZENE	......		5	
56666	ETHYLBENZENE	......		5	
56674	STYRENE	......		5	
56694	m-XYLENE	......		5	
56696	o-XYLENE	......		5	
56697	p-XYLENE	......		5	
	TOTAL XYLENES	......		5	
56649	1,2-DICHLOROBENZENE	......		5	
56650	1,3-DICHLOROBENZENE	......		5	
56651	1,4-DICHLOROBENZENE	......		5	

SURROGATE COMPOUND RECOVERIES	%	SOIL LIMITS	AQUEOUS LIMITS
SS1 D4-DICHLOROETHANE	90	70-121%	76-114%
SS2 D8-TOLUENE	103	84-138%	88-110%
SS3 BROMOFLUOROBENZENE	95	59-113%	86-115%

NET

5/05

NET ATLANTIC, INC CAMBRIDGE DIVISION
DATA WORKSHEET METHOD BLANK

DATE/TIME:920925 18:23 ANALYST:MANAGER INSTRUMENT:HP5970
BLANK FILE: >H4120
MATRIX: SOIL ✓ AQUEOUS ______ MEDIUM LEVEL ______.

TEST	COMPOUND NAME	RESULT UG/L	RESULT UG/KG	REPORTING LIMIT UG/L	REPORTING LIMIT UG/KG
56644	CHLOROMETHANE	......	ND	5	
56628	BROMOMETHANE	......		5	
56692	VINYL CHLORIDE	......		5	
56638	CHLOROETHANE	......		5	
56688	TRICHLOROFLUOROMETHANE	......		5	
56672	METHYLENE CHLORIDE	......		5	
56620	ACETONE	......		5	
56632	CARBON DISULFIDE	......		5	
56652	1,1-DICHLOROETHANE	......		5	
56656	1,1-DICHLOROETHENE	......		5	
56658	trans-1,2-DICHLOROETHENE	......		5	
	cis-1,2-DICHLOROETHENE			5	
56642	CHLOROFORM	......		5	
56654	1,2-DICHLOROETHANE	......		5	
56630	2-BUTANONE (MEK)	......		5	
56682	1,1,1-TRICHLOROETHANE	......		5	
56634	CARBON TETRACHLORIDE	......		5	
56690	VINYL ACETATE	......		5	
56624	BROMODICHLOROMETHANE	......		5	
56660	1,2-DICHLOROPROPANE	......		5	
56686	TRICHLOROETHENE	......		5	
56646	DIBROMOCHLOROMETHANE	......		5	
56664	1,1,2-TRICHLOROETHANE	......		5	
56622	BENZENE	......		5	
56684	trans-1,3-DICHLOROPROPENE	......		5	
	cis-1,3-DICHLOROPROPENE	......		5	
56640	2-CHLOROETHYLVINYL ETHER	......		5	
56626	BROMOFORM	......		5	
56670	4-METHYL-2-PENTANONE	......		5	
56666	2-HEXANONE	......		5	
56676	TETRACHLOROETHENE	......		5	
56678	1,1,2,2-TETRACHLOROETHANE	......		5	
56680	TOLUENE	......		5	
56636	CHLOROBENZENE	......		5	
56666	ETHYLBENZENE	......		5	
56674	STYRENE	......		5	
56694	m-XYLENE	......		5	
56695	o-XYLENE	......		5	
56697	p-XYLENE	......		5	
	TOTAL XYLENES	......		5	
56648	1,2-DICHLOROBENZENE	......		5	
56650	1,3-DICHLOROBENZENE	......		5	
56651	1,4-DICHLOROBENZENE	......		5	

SURROGATE COMPOUND RECOVERIES	%	SOIL LIMITS	AQUEOUS LIMITS
SS1 D4-DICHLOROETHANE	75	70-121%	76-114%
SS2 D8-TOLUENE	98	84-138%	88-110%
SS3 BROMOFLUOROBENZENE	92	59-113%	86-115%

NET

NET ATLANTIC, INC CAMBRIDGE DIVISION
DATA WORKSHEET METHOD BLANK

DATE/TIME:920929 12:32 ANALYST:JIM INSTRUMENT:HP5970
BLANK FILE: >E0178
MATRIX: SOIL ______ AQUEOUS __X__ MEDIUM LEVEL ______.

TEST	COMPOUND NAME	RESULT UG/L	RESULT UG/KG	REPORTING LIMIT UG/L	REPORTING LIMIT UG/KG
56644	CHLOROMETHANE	......		5	
56628	BROMOMETHANE	......		5	
56692	VINYL CHLORIDE	......		5	
56638	CHLOROETHANE	......		5	
56688	TRICHLOROFLUOROMETHANE	......		5	
56672	METHYLENE CHLORIDE	......		5	
56620	ACETONE	......		5	
56632	CARBON DISULFIDE	......		5	
56652	1,1-DICHLOROETHANE	......		5	
56656	1,1-DICHLOROETHENE	......		5	
56658	trans-1,2-DICHLOROETHENE	......		5	
	cis-1,2-DICHLOROETHENE			5	
56642	CHLOROFORM	......		5	
56654	1,2-DICHLOROETHANE	......		5	
56630	2-BUTANONE (MEK)	......		5	
56682	1,1,1-TRICHLOROETHANE	......		5	
56634	CARBON TETRACHLORIDE	......		5	
6690	VINYL ACETATE	......		5	
56624	BROMODICHLOROMETHANE	......		5	
56660	1,2-DICHLOROPROPANE	......		5	
56686	TRICHLOROETHENE	......		5	
56646	DIBROMOCHLOROMETHANE	......		5	
56684	1,1,2-TRICHLOROETHANE	......		5	
56622	BENZENE	1		5	
56664	trans-1,3-DICHLOROPROPENE	......		5	
	cis-1,3-DICHLOROPROPENE	......		5	
56640	2-CHLOROETHYLVINYL ETHER	......		5	
56626	BROMOFORM	......		5	
56670	4-METHYL-2-PENTANONE	......		5	
56668	2-HEXANONE	......		5	
56678	TETRACHLOROETHENE	......		5	
56676	1,1,2,2-TETRACHLOROETHANE	1		5	
56680	TOLUENE	......		5	
56676	CHLOROBENZENE	......		5	
56666	ETHYLBENZENE	......		5	
56674	STYRENE	......		5	
56694	m-XYLENE	......		5	
56696	o-XYLENE	......		5	
56697	p-XYLENE	......		5	
	TOTAL XYLENES	......		5	
56648	1,2-DICHLOROBENZENE	......		5	
56650	1,3-DICHLOROBENZENE	......		5	
56651	1,4-DICHLOROBENZENE	......		5	

SURROGATE COMPOUND RECOVERIES	%	SOIL LIMITS	AQUEOUS L
S51 D4-DICHLOROETHANE	99	70-121%	76-114%
S52 D8-TOLUENE	104	84-138%	88-110%
S53 BROMOFLUOROBENZENE	101	59-113%	86-115%

NET

B776

NET ATLANTIC, INC CAMBRIDGE DIVISION
DATA WORKSHEET METHOD BLANK

DATE/TIME:920929 16:05 ANALYST:JIM INSTRUMENT:HP5970
BLANK FILE: >E0181
MATRIX: SOIL ______ AQUEOUS ✓ MEDIUM LEVEL ______.

TEST	COMPOUND NAME	RESULT UG/L	RESULT UG/KG	REPORTING LIMIT UG/L	REPORTING LIMIT UG/KG
56644	CHLOROMETHANE	......	ND	5	
56628	BROMOMETHANE	......		5	
56692	VINYL CHLORIDE	......		5	
56638	CHLOROETHANE	......		5	
56688	TRICHLOROFLUOROMETHANE	......		5	
56672	METHYLENE CHLORIDE	......		5	
56620	ACETONE	......		5	
56632	CARBON DISULFIDE	......		5	
56652	1,1-DICHLOROETHANE	......		5	
56656	1,1-DICHLOROETHENE	......		5	
56658	trans-1,2-DICHLOROETHENE	......		5	
	cis-1,2-DICHLOROETHENE			5	
56642	CHLOROFORM	......		5	
56654	1,2-DICHLOROETHANE	......		5	
56630	2-BUTANONE (MEK)	......		5	
56682	1,1,1-TRICHLOROETHANE	......		5	
56634	CARBON TETRACHLORIDE	......		5	
56690	VINYL ACETATE	......		5	
56624	BROMODICHLOROMETHANE	......		5	
56660	1,2-DICHLOROPROPANE	......		5	
56686	TRICHLOROETHENE	......		5	
56646	DIBROMOCHLOROMETHANE	......		5	
56684	1,1,2-TRICHLOROETHANE	......		5	
56622	BENZENE	......		5	
56664	trans-1,3-DICHLOROPROPENE	......		5	
	cis-1,3-DICHLOROPROPENE	......		5	
56640	2-CHLOROETHYLVINYL ETHER	......		5	
56626	BROMOFORM	......		5	
56670	4-METHYL-2-PENTANONE	......		5	
56668	2-HEXANONE	......		5	
56678	TETRACHLOROETHENE	......		5	
56676	1,1,2,2-TETRACHLOROETHANE	......		5	
56680	TOLUENE	......		5	
56636	CHLOROBENZENE	......		5	
56666	ETHYLBENZENE	......		5	
56674	STYRENE	......		5	
56694	m-XYLENE	......		5	
56696	o-XYLENE	......		5	
56697	p-XYLENE	......		5	
	TOTAL XYLENES	......		5	
56648	1,2-DICHLOROBENZENE	......		5	
56650	1,3-DICHLOROBENZENE	......		5	
56651	1,4-DICHLOROBENZENE	......		5	

SURROGATE COMPOUND RECOVERIES	%	SOIL LIMITS	AQUEOUS LIMITS
SS1 D4-DICHLOROETHANE	99	70-121%	76-114%
SS2 D8-TOLUENE	102	84-138%	88-110%
SS3 BROMOFLUOROBENZENE	97	59-113%	86-115%

NET

NET ATLANTIC, INC. CAMBRIDGE DIVISION

DATA WORKSHEET METHOD BLANK

DATE/TIME:920929 16:01 ANALYST:JP INSTRUMENT:HP5970

BLANK FILE: >H4140

MATRIX: SOIL ✓ AQUEOUS ______ MEDIUM LEVEL ______.

TEST	COMPOUND NAME	RESULT UG/L	RESULT UG/KG	REPORTING LIMIT UG/L	REPORTING LIMIT UG/KG
56644	CHLOROMETHANE	......	ND	5	
55628	BROMOMETHANE	......		5	
56692	VINYL CHLORIDE	......		5	
56638	CHLOROETHANE	......		5	
56668	TRICHLOROFLUOROMETHANE	......		5	
56672	METHYLENE CHLORIDE	......		5	
56620	ACETONE	......		5	
56632	CARBON DISULFIDE	......		5	
56652	1,1-DICHLOROETHANE	......		5	
56655	1,1-DICHLOROETHENE	......		5	
56658	trans-1,2-DICHLOROETHENE	......		5	
	cis-1,2-DICHLOROETHENE			5	
56642	CHLOROFORM	......		5	
56654	1,2-DICHLOROETHANE	......		5	
56630	2-BUTANONE (MEK)	......		5	
56682	1,1,1-TRICHLOROETHANE	......		5	
56634	CARBON TETRACHLORIDE	......		5	
56690	VINYL ACETATE	......		5	
56624	BROMODICHLOROMETHANE	......		5	
56660	1,2-DICHLOROPROPANE	......		5	
56686	TRICHLOROETHENE	......		5	
56646	DIBROMOCHLOROMETHANE	......		5	
56684	1,1,2-TRICHLOROETHANE	......		5	
56622	BENZENE	......		5	
56664	trans-1,3-DICHLOROPROPENE	......		5	
	cis-1,3-DICHLOROPROPENE	......		5	
56640	2-CHLOROETHYLVINYL ETHER	......		5	
56626	BROMOFORM	......		5	
56670	4-METHYL-2-PENTANONE	......		5	
56658	2-HEXANONE	......		5	
56678	TETRACHLOROETHENE	......		5	
56676	1,1,2,2-TETRACHLOROETHANE	......		5	
56680	TOLUENE	......		5	
56636	CHLOROBENZENE	......		5	
56666	ETHYLBENZENE	......		5	
56674	STYRENE	......		5	
56694	m-XYLENE	......		5	
56696	o-XYLENE	......		5	
56697	p-XYLENE	......		5	
	TOTAL XYLENES	......		5	
56648	1,2-DICHLOROBENZENE	......		5	
56650	1,3-DICHLOROBENZENE	......		5	
56651	1,4-DICHLOROBENZENE	......		5	

SURROGATE COMPOUND RECOVERIES	%	SOIL LIMITS	AQUEOUS LIMITS
SS1 D4-DICHLOROETHANE	81	70-121%	76-114%
SS2 D8-TOLUENE	90	84-138%	88-110%
SS3 BROMOFLUOROBENZENE	87	59-113%	86-115%

NET

NET ATLANTIC, INC CAMBRIDGE DIVISION
– DATA WORKSHEET METHOD BLANK

DATE/TIME:920929 23:40 ANALYST:JP INSTRUMENT:HP5970
BLANK FILE: >H4149
MATRIX: SOIL ✓ AQUEOUS ______ MEDIUM LEVEL ______.

TEST	COMPOUND NAME	RESULT UG/L	RESULT UG/KG	REPORTING LIMIT UG/L	REPORTING LIMIT UG/KG
56644	CHLOROMETHANE	......	ND	5	
56628	BROMOMETHANE	......		5	
56692	VINYL CHLORIDE	......		5	
56636	CHLOROETHANE	......		5	
56688	TRICHLOROFLUOROMETHANE	......		5	
56672	METHYLENE CHLORIDE	......		5	
56620	ACETONE	......		5	
56632	CARBON DISULFIDE	......		5	
56652	1,1-DICHLOROETHANE	......		5	
56656	1,1-DICHLOROETHENE	......		5	
56658	trans-1,2-DICHLOROETHENE	......		5	
	cis-1,2-DICHLOROETHENE			5	
56642	CHLOROFORM	......		5	
56654	1,2-DICHLOROETHANE	......		5	
56630	2-BUTANONE (MEK)	......		5	
56682	1,1,1-TRICHLOROETHANE	......		5	
56634	CARBON TETRACHLORIDE	......		5	
56690	VINYL ACETATE	......		5	
56624	BROMODICHLOROMETHANE	......		5	
56660	1,2-DICHLOROPROPANE	......		5	
56686	TRICHLOROETHENE	......		5	
56646	DIBROMOCHLOROMETHANE	......		5	
56684	1,1,2-TRICHLOROETHANE	......		5	
56622	BENZENE	......		5	
56664	trans-1,3-DICHLOROPROPENE	......		5	
	cis-1,3-DICHLOROPROPENE	......		5	
56640	2-CHLOROETHYLVINYL ETHER	......		5	
56626	BROMOFORM	......		5	
56670	4-METHYL-2-PENTANONE	......		5	
56668	2-HEXANONE	......		5	
56678	TETRACHLOROETHENE	......		5	
56676	1,1,2,2-TETRACHLOROETHANE	......		5	
56680	TOLUENE	......		5	
56638	CHLOROBENZENE	......		5	
56666	ETHYLBENZENE	......		5	
56674	STYRENE	......		5	
56694	m-XYLENE	......		5	
56696	o-XYLENE	......		5	
56697	p-XYLENE	......		5	
	TOTAL XYLENES	......		5	
56648	1,2-DICHLOROBENZENE	......		5	
56650	1,3-DICHLOROBENZENE	......		5	
56651	1,4-DICHLOROBENZENE	......		5	

SURROGATE COMPOUND RECOVERIES	%	SOIL LIMITS	AQUEOUS LIMITS
SS1 D4-DICHLOROETHANE	79	70-121%	76-114%
SS2 D8-TOLUENE	103	84-138%	88-110%
SS3 BROMOFLUOROBENZENE	94	59-113%	86-115%

NET

NET ATLANTIC, INC CAMBRIDGE DIVISION
DATA WORKSHEET METHOD BLANK

DATE/TIME:920930 10:19 ANALYST:MARK INSTRUMENT:HP59 70
BLANK FILE: >G8038
MATRIX: SOIL ______ AQUEOUS ✓ MEDIUM LEVEL ______.

TEST	COMPOUND NAME	RESULT UG/L	RESULT UG/KG	REPORTING LIMIT UG/L	REPORTING LIMIT UG/KG
56644	CHLOROMETHANE	......		5	
56628	BROMOMETHANE	......		5	
56692	VINYL CHLORIDE	......		5	
56638	CHLOROETHANE	......		5	
56688	TRICHLOROFLUOROMETHANE	......		5	
56672	METHYLENE CHLORIDE	......		5	
56620	ACETONE	...7..		5	
56632	CARBON DISULFIDE	......		5	
56652	1,1-DICHLOROETHANE	......		5	
56656	1,1-DICHLOROETHENE	......		5	
56658	trans-1,2-DICHLOROETHENE	......		5	
	cis-1,2-DICHLOROETHENE	......		5	
56642	CHLOROFORM	......		5	
56654	1,2-DICHLOROETHANE	......		5	
56630	2-BUTANONE (MEK)	......		5	
56682	1,1,1-TRICHLOROETHANE	......		5	
56634	CARBON TETRACHLORIDE	......		5	
56690	VINYL ACETATE	......		5	
56624	BROMODICHLOROMETHANE	......		5	
56660	1,2-DICHLOROPROPANE	......		5	
56686	TRICHLOROETHENE	......		5	
56646	DIBROMOCHLOROMETHANE	......		5	
56684	1,1,2-TRICHLOROETHANE	......		5	
56622	BENZENE	......		5	
56664	trans-1,3-DICHLOROPROPENE	......		5	
	cis-1,3-DICHLOROPROPENE	......		5	
56640	2-CHLOROETHYLVINYL ETHER	......		5	
56626	BROMOFORM	......		5	
56670	4-METHYL-2-PENTANONE	......		5	
56668	2-HEXANONE	......		5	
56678	TETRACHLOROETHENE	......		5	
56676	1,1,2,2-TETRACHLOROETHANE	...1..		5	
56680	TOLUENE	......		5	
56636	CHLOROBENZENE	......		5	
56666	ETHYLBENZENE	......		5	
56674	STYRENE	......		5	
56694	m-XYLENE	......		5	
56696	o-XYLENE	......		5	
56697	p-XYLENE	......		5	
	TOTAL XYLENES	......		5	
56648	1,2-DICHLOROBENZENE	......		5	
56650	1,3-DICHLOROBENZENE	......		5	
56651	1,4-DICHLOROBENZENE	......		5	

SURROGATE COMPOUND RECOVERIES	%	SOIL LIMITS	AQUEOUS LI
581 D4-DICHLOROETHANE	..95...	70-121%	76-114%
582 D8-TOLUENE	..97...	84-138%	88-110%
583 BROMOFLUOROBENZENE	..100..	59-113%	86-115%

NET

3

NET ATLANTIC, INC CAMBRIDGE DIVISION
DATA WORKSHEET METHOD BLANK

DATE/TIME:920930 13:35 ANALYST:MARK INSTRUMENT:HP59 70
BLANK FILE: >G8042
MATRIX: SOIL ______ AQUEOUS ✓ MEDIUM LEVEL ______.

TEST	COMPOUND NAME	RESULT UG/L	RESULT UG/KG	REPORTING LIMIT UG/L	REPORTING LIMIT UG/KG
56644	CHLOROMETHANE	......	ND	5	
56628	BROMOMETHANE	......		5	
56692	VINYL CHLORIDE	......		5	
56638	CHLOROETHANE	......		5	
56688	TRICHLOROFLUOROMETHANE	......		5	
56672	METHYLENE CHLORIDE	......		5	
56620	ACETONE	......		5	
56632	CARBON DISULFIDE	......		5	
56652	1,1-DICHLOROETHANE	......		5	
56656	1,1-DICHLOROETHENE	......		5	
56658	trans-1,2-DICHLOROETHENE	......		5	
	cis-1,2-DICHLOROETHENE	......		5	
56642	CHLOROFORM	......		5	
56654	1,2-DICHLOROETHANE	......		5	
56630	2-BUTANONE (MEK)	......		5	
56682	1,1,1-TRICHLOROETHANE	......		5	
56634	CARBON TETRACHLORIDE	......		5	
56690	VINYL ACETATE	......		5	
56624	BROMODICHLOROMETHANE	......		5	
56660	1,2-DICHLOROPROPANE	......		5	
56686	TRICHLOROETHENE	......		5	
56646	DIBROMOCHLOROMETHANE	......		5	
56684	1,1,2-TRICHLOROETHANE	......		5	
56622	BENZENE	......		5	
56664	trans-1,3-DICHLOROPROPENE	......		5	
	cis-1,3-DICHLOROPROPENE	......		5	
56640	2-CHLOROETHYLVINYL ETHER	......		5	
56626	BROMOFORM	......		5	
56670	4-METHYL-2-PENTANONE	......		5	
56668	2-HEXANONE	......		5	
56678	TETRACHLOROETHENE	......		5	
56676	1,1,2,2-TETRACHLOROETHANE	......		5	
56680	TOLUENE	......		5	
56636	CHLOROBENZENE	......		5	
56666	ETHYLBENZENE	......		5	
56674	STYRENE	......		5	
56694	m-XYLENE	......		5	
56696	o-XYLENE	......		5	
56697	p-XYLENE	......		5	
	TOTAL XYLENES	......		5	
56648	1,2-DICHLOROBENZENE	......		5	
56650	1,3-DICHLOROBENZENE	......		5	
56651	1,4-DICHLOROBENZENE	......		5	

SURROGATE COMPOUND RECOVERIES	%	SOIL LIMITS	AQUEOUS L
SS1 D4-DICHLOROETHANE	..101...	70-121%	76-114%
SS2 D8-TOLUENE	..102...	84-138%	88-110%
SS3 BROMOFLUOROBENZENE	..105...	59-113%	86-115%

NET

ND

9-29-92 H
8253

NET CAMBRIDGE

SOIL VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

JOB NO. 92.34112 SAMPLE NO. 67139

Kaiser

– FILE

COMPOUNDS	SPIKE ADDED (UG/Kg)	SAMPLE CONCENTRATION (UG/Kg)	MS CONCENTRATION (UG/Kg)	MS % REC.	QC LIMITS REC
1,1-DICHLOROETHENE..	50	0.0	39.9	79.8	59-172
TRICHLOROETHENE.....	50	0.0	38.9	77.8	62-137
BENZENE.............	50	0.0	44.8	89.6	66-142
TOLUENE.............	50	0.0	47.4	94.8	59-139
CHLOROBENZENE.......	50	0.0	42.6	85.2	60-133

FILE

COMPOUNDS	SPIKE ADDED (UG/Kg)	MSD CONCENTRATION (UG/Kg)	MSD % REC.	% RPD.	QC LIMITS % RPD	QC LIMITS % REC
1,1-DICHLOROETHENE..	50	43.7	87.3	9	22	59-172
TRICHLOROETHENE.....	50	41.3	82.5	6	24	62-137
BENZENE.............	50	47.3	94.5	5	21	66-142
TOLUENE.............	50	51.3	102.6	8	21	59-139
CHLOROBENZENE.......	50	45.1	90.2	6	21	60-133

(%RPD FOR COMM.
<= 25%)

VALUES OUTSIDE OF QC LIMITS

RPD: 0 OUT OF 5 OUTSIDE LIMITS

SPIKE RECOVERY: 0 OUT OF 10 OUTSIDE OF LIMITS

COMMENTS: ____________________

NET

92 240
92.34098

CHAIN OF CUSTODY RECORD

PROJECT NAME: PPG CIRCLEVILLE
COMPANY: ICF KAISER ENGINEERS
ADDRESS: 4 Gateway Center Pittsburgh PA 15222
PHONE: (412) 497-2385

NET NATIONAL ENVIRONMENTAL TESTING, INC.®
Cambridge Division, 12 Oak Park, Bedford, MA 01730

SAMPLED BY
CHARLES E. HAEFNER (Print Name) — Charles E Haefner Jr (Signature)
H. Douglas WEEKS JR (Print Name) — H Douglas Weeks Jr (Signature)

SAMPLE NO.	DATE	TIME	SAMPLE LOCATION	CONTAINER SIZE	CONTAINER G/P	GRAB	COMP	NO. OF CONTAINERS	SAMPLE MATRIX	PRESERVATIVE	Volatile Organics	Extractable Organics	Pesticides/PCBs	Metals	Cyanide	Phenols	5 Day TA	Normal TA	COMMENTS
CV-92-340-W45	9/23	1338	WEST STORAGE PAD	4oz	G	X		1	SOIL	ICE	X						X		EPA SW846
CV-92-341-W45		1340				X		1		ICE	X							X	Method 8240
CV-92-342-W51		1050				X		1		ICE	X						X		
CV-92-343-W51		1050				X		1		ICE	X							X	
CV-92-344-W56		1219				X		1		ICE	X						X		
CV-92-345-W56		1219				X		1		ICE	X							X	
CV-92-346-W60		1250				X		1		ICE	X						X		
CV-92-347-W60A		1310				X		1		ICE	X						X		
CV-92-348-W6		1120				X		1		ICE	X							X	
CV-92-349-W44		1135				X		1		ICE	X							X	
CV-92-359-W60A		1310				X		1		ICE	X							X	
CV-92-357-FBW		1353	"	"	"	X		2	WATER	ICE	X						X		

Relinquished by	Date / Time	Received by	Relinquished by	Date / Time	Received by
Charles E Haefner Jr	9/23 1725			9/24 11:00	Maureen D[illegible]
Relinquished by	Date / Time	Received by	Relinquished by	Date / Time	Received for Laboratory by

Method of Shipment: Fed Express

® Normal TA = Hold pending results of 5 day TA samples per Chuck Haefner 9/24/92

PT 1 — ORIGINAL PT 2 NET Project Manager—Yellow PT 3—Customer Copy—Pink

Temp 3

92.34098
92.34096

CHAIN OF CUSTODY RECORD

NET NATIONAL ENVIRONMENTAL TESTING, INC.

Cambridge Division, 12 Oak Park, Bedford, MA 01730

PROJECT NAME PPG CIRCLEVILLE

COMPANY ICF KAISER ENGINEERS

ADDRESS 4 Gateway Center Pittsburgh PA 15222

PHONE (412) 497-2385

SAMPLED BY

CHARLES E. HAEFNER (Print Name) — Signature: Charles E Haefner Jr

A. DOUGLAS WEEKS JR (Print Name) — Signature: A. Douglas Weeks JR.

SAMPLE NO.	DATE	TIME	SAMPLE LOCATION	CONTAINER SIZE	CONTAINER G/P	GRAB	COMP	NO. OF CONTAINERS	SAMPLE MATRIX	PRESERVATIVE	Volatile Organics	Extractable Organics	Pesticides/PCBs	Metals	Cyanide	Phenols	5 Day TA		NORMAL TA		COMMENTS
CV-92-350-S79	9/23	1645	SOUTH STORAGE PAD	4 oz	G	X		1	SOIL	ICE	X						X				EPA SW846
CV-92-351-S79		1645			G	X		1	SOIL	ICE	X								X		Method 8240
~~CV-92-352-S146~~		~~1700~~			~~G~~	~~X~~		~~1~~	~~SOIL~~	~~ICE~~	~~X~~										
~~CV-92-353-S146~~					~~G~~	~~X~~			~~SOIL~~	~~ICE~~	~~X~~										
CV-92-354-S152		1710			G	X		1	SOIL	ICE	X						X				
CV-92-355-S152		1710			G	X		1	SOIL	ICE	X								X		
CV-92-356-S100		1725			G	X		1	SOIL	ICE	X								X		

Relinquished by	Date / Time	Received by	Relinquished by	Date / Time	Received by
CHARLES E. HAEFNER	9/23			9/24 11:00	Maureen Sleeman
Relinquished by Charles E Haefner Jr	**Date / Time**	**Received by**	**Relinquished by**	**Date / Time**	**Received for Laboratory by**

Method of Shipment: FED Express

(*) Normal TA = Hold Pending Result of RUSH Samples

per Chuck Haefner - 9/24/92

PT 1 — ORIGINAL   PT 2 NET Project Manager—Yellow   PT 3—Customer Copy—Pink

CHAIN OF CUSTODY RECORD

NET® NATIONAL ENVIRONMENTAL TESTING, INC.
Cambridge Division, 12 Oak Park, Bedford, MA 01730

921 ... 92...

PROJECT NAME PPG CIRCLEVILLE
COMPANY ICF KAISER ENGINEERS
ADDRESS FOUR GATEWAY CENTER Pittsburgh PA 15222
PHONE (412) 497

SAMPLED BY
A. Douglas Weeks Jr (Print Name) A. Douglas Weeks Jr (Signature)
CHARLES E. HAEFNER (Print Name) Charles E. Haefner (Signature)

SAMPLE NO.	DATE	TIME	SAMPLE LOCATION	CONTAINER SIZE	CONTAINER G/P	GRAB	COMP	NO. OF CONTAINERS	SAMPLE MATRIX	PRESERVATIVE	Volatile Organics	Extractable Organics	Pesticides/PCBs	Metals	Cyanide	Phenols	5 DAY TA		Hold thru Samples	COMMENTS
CV-92-330-I34	9/24	0904	Incinerator PAD	4oz	G	X		1	Soil	ICE	X						X			EPA SW846
CV-92-331-I34	9/24	0910	Incinerator Pad								X								X	Method 8240
CV-92-332-I36	9/24	0932									X						X			
CV-92-333-I36	9/24	0940									X								X	
CV-92-334-I56	9/24	0830									X						X			
CV-92-335-I56	9/24	0830									X								X	
CV-92-336-I113	9/24	0830									X						X			
CV-92-337-I113	9/24	0830									X								X	
CV-92-338-I24	9/24	0955									X								X	
CV-92-339-I45	9/24	0815									X								X	
CV-92-358-FBI	9/24	1015		40ml	G	X		2	Water	ICE	X						X			
CV-92-353-S146	9/24	1115	South Storage PAD	4oz	G	X		1	Soil	ICE	X								X	
CV-92-360-S146	9/24	1120	South Storage PAD	"	"	X		1	Soil	ICE	X						X			

Relinquished by	Date / Time	Received by	Relinquished by	Date / Time	Received by
CHARLES E. HAEFNER Charles E. Haefner	9/24/92 1230			9/25 11:00	Maureen ...
Relinquished by	Date / Time	Received by	Relinquished by:	Date / Time	Received for Laboratory by:

Method of [shipment] FEDEX NET 1798251

PT 1 — ORIGINAL PT 2 NET Project Manager—Yellow PT 3—Customer Copy—Pink

ANALYTICAL REPORT

Report To: Mr. Robert Bear
ICF Kaiser Engineers
Four Gateway Center
12th Floor
Pittsburgh, PA 15222

Project: PPG Soil VOAs-Now RUN

10/19/1992

NET Job Number: 92.34098

National Environmental Testing

NET Atlantic, Inc.
Cambridge Division
12 Oak Park
Bedford, MA 01730

NET Cambridge Division

ANALYTICAL REPORT

Report To:	Reported By:
Mr. Robert Bear ICF Kaiser Engineers Four Gateway Center 12th Floor Pittsburgh, PA 15222	National Environmental Testing NET Atlantic, Incorporated Cambridge Division 12 Oak Park Bedford, MA 01730

Report Date: 10/19/1992 Collected By: ICF NET Job Number: 92.34098

Project: PPG Soil VOAs-Now RUN Shipped Via: FEDEX Client P.O. No: bill to ICF dir

Job Description: PPG Soil VOAs-NOW RUN Airbill No: 4450798273 NET Client No: 49655

This report has been approved and certified for release by the following staff. Please feel free to call the NET Project Manager at 617-275-3535 with any questions or comments.

Edward A. Lawler
NET Project Manager

Michael F. Delaney, Ph.D.
Laboratory Director

Analytical data for the following samples are included in this data report.

SAMPLE ID	NET ID	DATE TAKEN	TIME TAKEN	DATE REC'D	MATRIX
CV-92-351-S79	67060	09/23/1992	16:45	09/24/1992	SOIL
CV-92-359-W60A	67068	09/23/1992	13:10	09/24/1992	SOIL

NET Cambridge Division
ANALYTICAL REPORT

ort Date: 10/19/1992

Report To: ICF Kaiser Engineers — NET Job No: 92.34098

Project: PPG Soil VOAs-Now RUN — Date Rec'd: 09/24/1992

Sample ID: CV-92-351-S79

NET Sample No: 67060

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<6.0	ug/Kg	10/06/1992	dry
Benzene	<6.0	ug/Kg		
Bromodichloromethane	<6.0	ug/Kg		
Bromoform	<6.0	ug/Kg		
Bromomethane	<6.0	ug/Kg		
2-Butanone (MEK)	<6.0	ug/Kg		
Carbon Disulfide	<6.0	ug/Kg		
Carbon Tetrachloride	<6.0	ug/Kg		
Chlorobenzene	<6.0	ug/Kg		
Chloroethane	<6.0	ug/Kg		
2-Chloroethylvinyl ether	<6.0	ug/Kg		
Chloroform	<6.0	ug/Kg		
Chloromethane	<6.0	ug/Kg		
Dibromochloromethane	<6.0	ug/Kg		
1,2-Dichlorobenzene	<6.0	ug/Kg		
1,3-Dichlorobenzene	<6.0	ug/Kg		
1,4-Dichlorobenzene	<6.0	ug/Kg		
1,1-Dichloroethane	<6.0	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg		
1,1-Dichloroethene	<6.0	ug/Kg		
trans-1,2-Dichloroethene	<6.0	ug/Kg		
1,2-Dichloropropane	<6.0	ug/Kg		
cis-1,3-Dichloropropene	<6.0	ug/Kg		
trans-1,3-Dichloropropene	<6.0	ug/Kg		
Ethylbenzene	<6.0	ug/Kg		
2-Hexanone	<6.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
Methylene Chloride	<6.0	ug/Kg		
Styrene	<6.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg		
Tetrachloroethene	<6.0	ug/Kg		
Toluene	<6.0	ug/Kg		
1,1,1-Trichloroethane	<6.0	ug/Kg		
1,1,2-Trichloroethane	<6.0	ug/Kg		
Trichloroethene	<6.0	ug/Kg		
Trichlorofluoromethane	<6.0	ug/Kg		
Vinyl Acetate	<6.0	ug/Kg		
Vinyl Chloride	<6.0	ug/Kg		
m-Xylene	<6.0	ug/Kg		
o-Xylene	<6.0	ug/Kg		
p-Xylene	<6.0	ug/Kg		

NET Cambridge Division
ANALYTICAL REPORT

rt Date: 10/19/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34098

Project: PPG Soil VOAs-Now RUN

Date Rec'd: 09/24/1992

Sample ID: CV-92-359-W60A

NET Sample No: 67068

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<5.0	ug/Kg	10/06/1992	dhg
Benzene	<5.0	ug/Kg		
Bromodichloromethane	<5.0	ug/Kg		
Bromoform	<5.0	ug/Kg		
Bromomethane	<5.0	ug/Kg		
2-Butanone (MEK)	<5.0	ug/Kg		
Carbon Disulfide	<5.0	ug/Kg		
Carbon Tetrachloride	<5.0	ug/Kg		
Chlorobenzene	<5.0	ug/Kg		
Chloroethane	<5.0	ug/Kg		
2-Chloroethylvinyl ether	<5.0	ug/Kg		
Chloroform	<5.0	ug/Kg		
Chloromethane	<5.0	ug/Kg		
Dibromochloromethane	<5.0	ug/Kg		
1,2-Dichlorobenzene	<5.0	ug/Kg		
1,3-Dichlorobenzene	<5.0	ug/Kg		
1,4-Dichlorobenzene	<5.0	ug/Kg		
1,1-Dichloroethane	<5.0	ug/Kg		
1,2-Dichloroethane	<5.0	ug/Kg		
1,1-Dichloroethene	<5.0	ug/Kg		
trans-1,2-Dichloroethene	<5.0	ug/Kg		
1,2-Dichloropropane	<5.0	ug/Kg		
cis-1,3-Dichloropropene	<5.0	ug/Kg		
trans-1,3-Dichloropropene	<5.0	ug/Kg		
Ethylbenzene	<5.0	ug/Kg		
2-Hexanone	<5.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<5.0	ug/Kg		
Methylene Chloride	<5.0	ug/Kg		
Styrene	<5.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg		
Tetrachloroethene	<5.0	ug/Kg		
Toluene	<5.0	ug/Kg		
1,1,1-Trichloroethane	<5.0	ug/Kg		
1,1,2-Trichloroethane	<5.0	ug/Kg		
Trichloroethene	<5.0	ug/Kg		
Trichlorofluoromethane	<5.0	ug/Kg		
Vinyl Acetate	<5.0	ug/Kg		
Vinyl Chloride	<5.0	ug/Kg		
m-Xylene	<5.0	ug/Kg		
o-Xylene	<5.0	ug/Kg		
p-Xylene	<5.0	ug/Kg		

CHAIN OF CUSTODY RECORD

NET NATIONAL ENVIRONMENTAL TESTING, INC.
Cambridge Division, 12 Oak Park, Bedford, MA 01730

92.34010
92.34096

PROJECT NAME PPG CIRCLEVILLE
COMPANY ICF KAISER ENGINEERS
ADDRESS 4 Gateway Center Pittsburgh PA 15222
PHONE (412) 497-2385

SAMPLED BY
CHARLES E. HAEFNER (Print Name) — Signature: Charles E Haefner Jr
A. DOUGLAS WEEKS JR (Print Name) — Signature: A. Douglas Weeks Jr.

SAMPLE NO.	DATE	TIME	SAMPLE LOCATION	CONTAINER SIZE	CONTAINER G/P	GRAB	COMP	NO OF CONTAINERS	SAMPLE MATRIX	PRESERVATIVE	Volatile Organics	Extractable Organics	Pesticides/PCBs	Metals	Cyanide	Phenols	3 Day TA		NORMAL TA		COMMENTS
V-92-350-S17	9/23	1645	COAL TAR STORAGE YRD	4oz	G	X		1	SOIL	ICE	✓						X				EPA SW846
V-92-351-S17		1645			G	X		1	SOIL	ICE	✓								X		Method 8240
~~V-92-352-S146~~		~~1640~~			~~G~~	~~X~~		~~1~~	~~SOIL~~	~~ICE~~	~~X~~										
~~V-92-353-S146~~					~~G~~	~~X~~		~~1~~	~~SOIL~~	~~ICE~~	~~X~~										
V-92-354-S152		1710			G	X		1	SOIL	ICE	X						X				
V-92-355-S152		1710			G	X		1	SOIL	ICE	X								X		
V-92-356-S100		1725			G	X		1	SOIL	ICE	X								X		

Relinquished by	Date / Time	Received by:	Relinquished by:	Date / Time	Received by:
CHARLES E. HAEFNER	9/23			9/24 11:00	Maureen D. Alvarez
Relinquished by Charles E Haefner Jr	**Date / Time**	**Received by**	**Relinquished by:**	**Date / Time**	**Received for Laboratory by:**

Method of Shipment: FEDERAL Express

Remarks: Ⓡ Normal TA = Hold Pending results of RUSH Samples

MPS 925 7268 404

PT 1 — ORIGINAL PT 2 NET Project Manager—Yellow PT 3—Customer Copy—Pink

Per Chuck Haefner 9/24/92

CHAIN OF CUSTODY RECORD

PROJECT NAME: PPG CIRCLEVILLE
COMPANY: ICF KAISER ENGINEERS
ADDRESS: 4 Gateway Center Pittsburgh PA 15222
PHONE: (412) 497-2385

NET NATIONAL ENVIRONMENTAL TESTING, INC.
Cambridge Division, 12 Oak Park, Bedford, MA 01730

SAMPLED BY: CHARLES E. HAEFNER (Print Name) Signature: Charles E Haefner Jr
A. Douglas WEEKS JR (Print Name) Signature: A. Douglas Weeks Jr

SAMPLE NO.	DATE	TIME	SAMPLE LOCATION	CONTAINER SIZE	CONTAINER G/P	GRAB	COMP	NO OF CONTAINERS	SAMPLE MATRIX	PRESERVATIVE	Volatile Organics	Extractable Organics	Pesticides/PCBs	Metals	Cyanide	Phenols	5 Day TA	NORMAL TA	COMMENTS
[illegible]-92-340-W45	9/23	1334	WEST STORAGE TANK	40ml	G	X		1	WATER	ICE	X						X		CLP SW846
V-92-341-W45	↓	1340	↓	↓	↓	X		1	↓	ICE	X							X	Method 8240
V-92-342-W51	↓	1050	↓	↓	↓	X		1	↓	ICE	X						X		↓
CV-92-343-W51	↓	1050	↓	↓	↓	X		1	↓	ICE	X							X	↓
CV-92-344-W56	↓	1219	↓	↓	↓	X		1	↓	ICE	X						X		↓
CV-92-345-W56	↓	1219	↓	↓	↓	X		1	↓	ICE	X							X	↓
V-92-346-W60	↓	1250	↓	↓	↓	X		1	↓	ICE	X						X		↓
V-92-347-W60A	↓	1310	↓	↓	↓	X		1	↓	ICE	X						X		↓
V-92-348-W6	↓	1120	↓	↓	↓	X		1	↓	ICE	X							X	↓
V-92-349-W44	↓	1135	↓	↓	↓	X		1	↓	ICE	X							X	↓
V-92-359-W60A	↓	1310	↓	↓	↓	X		1	↓	ICE	X							X	↓
V-92-357-FBW		1353	"	"	"	X		2	WATER	ICE	X						X		↓

~~[illegible]~~ above CCH

Relinquished by	Date / Time	Received by	Relinquished by	Date / Time	Received by
Charles E Haefner Jr	9/23 1725			9/24 11:00	Maureen [illegible]
Relinquished by	Date / Time	Received by	Relinquished by	Date / Time	Received for Laboratory by

Method of Shipment: Fed-X-press

Remarks: Ⓡ Normal TA = Hold Pending results of 5 day TA Sample An[illegible]

PT 1 — ORIGINAL PT 2 NET Project Manager—Yellow PT 3—Customer Copy—Pink

per check [illegible] 9/24/[illegible]

4450798273

ANALYTICAL REPORT

Report To: Mr. Robert Bear
ICF Kaiser Engineers
Four Gateway Center
12th Floor
Pittsburgh, PA 15222

Project: PPG RUSH SOIL VOAs

11/10/1992

NET Job Number: 92.34511

National Environmental Testing

NET Atlantic, Inc.
Cambridge Division
12 Oak Park
Bedford, MA 01730

NET Cambridge Division

ANALYTICAL REPORT

Report To:	Reported By:
Mr. Robert Bear ICF Kaiser Engineers Four Gateway Center 12th Floor Pittsburgh, PA 15222	National Environmental Testing NET Atlantic, Incorporated Cambridge Division 12 Oak Park Bedford, MA 01730

Report Date: 11/10/1992
Collected By: ICF
NET Job Number: 92.34511

Project: PPG RUSH SOIL VOAs
Shipped Via: FEDEX
Client P.O. No: bill to ICF dir

Job Description: PPG RUSH SOIL VOAs
Airbill No: 3977256920
NET Client No: 49655

This report has been approved and certified for release by the following staff. Please feel free to call the NET Project Manager at 617-275-3535 with any questions or comments.

Edward A. Lawler
NET Project Manager

Michael F. Delaney, Ph.D.
Laboratory Director

Analytical data for the following samples are included in this data report.

SAMPLE ID	NET ID	DATE TAKEN	TIME TAKEN	DATE REC'D	MATRIX
CV-92-0524-I24	68790	10/31/1992	10:25	11/02/1992	SOIL
CV-92-0525-I45	68791	10/31/1992	10:40	11/02/1992	SOIL
CV-92-0526-S100	68792	10/31/1992	11:08	11/02/1992	SOIL
CV-92-0527-W6	68793	10/31/1992	11:45	11/02/1992	SOIL
CV-92-0528-W44	68794	10/31/1992	11:30	11/02/1992	SOIL
CV-92-0529-FBW	68795	10/31/1992	11:55	11/02/1992	BLANK

NET Cambridge Division
ANALYTICAL REPORT

ɔort Date: 11/10/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Date Rec'd: 11/02/1992

Sample ID: CV-92-0524-I24

NET Sample No: 68790

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<6.0	ug/Kg	11/05/1992	dhg
Benzene	<6.0	ug/Kg		
Bromodichloromethane	<6.0	ug/Kg		
Bromoform	<6.0	ug/Kg		
Bromomethane	<6.0	ug/Kg		
2-Butanone (MEK)	<6.0	ug/Kg		
Carbon Disulfide	<6.0	ug/Kg		
Carbon Tetrachloride	<6.0	ug/Kg		
Chlorobenzene	<6.0	ug/Kg		
Chloroethane	<6.0	ug/Kg		
2-Chloroethylvinyl ether	<6.0	ug/Kg		
Chloroform	<6.0	ug/Kg		
Chloromethane	<6.0	ug/Kg		
Dibromochloromethane	<6.0	ug/Kg		
1,2-Dichlorobenzene	<6.0	ug/Kg		
1,3-Dichlorobenzene	<6.0	ug/Kg		
1,4-Dichlorobenzene	<6.0	ug/Kg		
1,1-Dichloroethane	<6.0	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg		
1,1-Dichloroethene	<6.0	ug/Kg		
trans-1,2-Dichloroethene	<6.0	ug/Kg		
1,2-Dichloropropane	<6.0	ug/Kg		
cis-1,3-Dichloropropene	<6.0	ug/Kg		
trans-1,3-Dichloropropene	<6.0	ug/Kg		
Ethylbenzene	<6.0	ug/Kg		
2-Hexanone	<6.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
Methylene Chloride	21	ug/Kg		
Styrene	<6.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg		
Tetrachloroethene	<6.0	ug/Kg		
Toluene	<6.0	ug/Kg		
1,1,1-Trichloroethane	<6.0	ug/Kg		
1,1,2-Trichloroethane	<6.0	ug/Kg		
Trichloroethene	<6.0	ug/Kg		
Trichlorofluoromethane	<6.0	ug/Kg		
Vinyl Acetate	<6.0	ug/Kg		
Vinyl Chloride	<6.0	ug/Kg		
m-Xylene	<6.0	ug/Kg		
o-Xylene	<6.0	ug/Kg		
p-Xylene	<6.0	ug/Kg		

NET Cambridge Division
ANALYTICAL REPORT

ort Date: 11/10/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Date Rec'd: 11/02/1992

Sample ID: CV-92-0525-145

NET Sample No: 68791

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<5.0	ug/Kg	11/05/1992	dhg
Benzene	<5.0	ug/Kg		
Bromodichloromethane	<5.0	ug/Kg		
Bromoform	<5.0	ug/Kg		
Bromomethane	<5.0	ug/Kg		
2-Butanone (MEK)	<5.0	ug/Kg		
Carbon Disulfide	<5.0	ug/Kg		
Carbon Tetrachloride	<5.0	ug/Kg		
Chlorobenzene	<5.0	ug/Kg		
Chloroethane	<5.0	ug/Kg		
2-Chloroethylvinyl ether	<5.0	ug/Kg		
Chloroform	<5.0	ug/Kg		
Chloromethane	<5.0	ug/Kg		
Dibromochloromethane	<5.0	ug/Kg		
1,2-Dichlorobenzene	<5.0	ug/Kg		
1,3-Dichlorobenzene	<5.0	ug/Kg		
1,4-Dichlorobenzene	<5.0	ug/Kg		
1,1-Dichloroethane	<5.0	ug/Kg		
1,2-Dichloroethane	<5.0	ug/Kg		
1,1-Dichloroethene	<5.0	ug/Kg		
trans-1,2-Dichloroethene	<5.0	ug/Kg		
1,2-Dichloropropane	<5.0	ug/Kg		
cis-1,3-Dichloropropene	<5.0	ug/Kg		
trans-1,3-Dichloropropene	<5.0	ug/Kg		
Ethylbenzene	<5.0	ug/Kg		
2-Hexanone	<5.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<5.0	ug/Kg		
Methylene Chloride	13	ug/Kg		
Styrene	<5.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg		
Tetrachloroethene	<5.0	ug/Kg		
Toluene	<5.0	ug/Kg		
1,1,1-Trichloroethane	<5.0	ug/Kg		
1,1,2-Trichloroethane	<5.0	ug/Kg		
Trichloroethene	<5.0	ug/Kg		
Trichlorofluoromethane	<5.0	ug/Kg		
Vinyl Acetate	<5.0	ug/Kg		
Vinyl Chloride	<5.0	ug/Kg		
m-Xylene	<5.0	ug/Kg		
o-Xylene	<5.0	ug/Kg		
p-Xylene	<5.0	ug/Kg		

NET Cambridge Division
ANALYTICAL REPORT

ort Date: 11/10/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Date Rec'd: 11/02/1992

Sample ID: CV-92-0526-S100

NET Sample No: 68792

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<6.0	ug/Kg	11/05/1992	dhg
Benzene	<6.0	ug/Kg		
Bromodichloromethane	<6.0	ug/Kg		
Bromoform	<6.0	ug/Kg		
Bromomethane	<6.0	ug/Kg		
2-Butanone (MEK)	<6.0	ug/Kg		
Carbon Disulfide	<6.0	ug/Kg		
Carbon Tetrachloride	<6.0	ug/Kg		
Chlorobenzene	<6.0	ug/Kg		
Chloroethane	<6.0	ug/Kg		
2-Chloroethylvinyl ether	<6.0	ug/Kg		
Chloroform	<6.0	ug/Kg		
Chloromethane	<6.0	ug/Kg		
Dibromochloromethane	<6.0	ug/Kg		
1,2-Dichlorobenzene	<6.0	ug/Kg		
1,3-Dichlorobenzene	<6.0	ug/Kg		
1,4-Dichlorobenzene	<6.0	ug/Kg		
1,1-Dichloroethane	<6.0	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg		
1,1-Dichloroethene	<6.0	ug/Kg		
trans-1,2-Dichloroethene	<6.0	ug/Kg		
1,2-Dichloropropane	<6.0	ug/Kg		
cis-1,3-Dichloropropene	<6.0	ug/Kg		
trans-1,3-Dichloropropene	<6.0	ug/Kg		
Ethylbenzene	<6.0	ug/Kg		
2-Hexanone	<6.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
Methylene Chloride	31	ug/Kg		
Styrene	<6.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg		
Tetrachloroethene	<6.0	ug/Kg		
Toluene	<6.0	ug/Kg		
1,1,1-Trichloroethane	<6.0	ug/Kg		
1,1,2-Trichloroethane	<6.0	ug/Kg		
Trichloroethene	<6.0	ug/Kg		
Trichlorofluoromethane	<6.0	ug/Kg		
Vinyl Acetate	<6.0	ug/Kg		
Vinyl Chloride	<6.0	ug/Kg		
m-Xylene	<6.0	ug/Kg		
o-Xylene	<6.0	ug/Kg		
p-Xylene	<6.0	ug/Kg		

NET Cambridge Division
ANALYTICAL REPORT

port Date: 11/10/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Date Rec'd: 11/02/1992

Sample ID: CV-92-0527-W6

NET Sample No: 68793

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<6.0	ug/Kg	11/08/1992	dhg
Benzene	<6.0	ug/Kg		
Bromodichloromethane	<6.0	ug/Kg		
Bromoform	<6.0	ug/Kg		
Bromomethane	<6.0	ug/Kg		
2-Butanone (MEK)	<6.0	ug/Kg		
Carbon Disulfide	<6.0	ug/Kg		
Carbon Tetrachloride	<6.0	ug/Kg		
Chlorobenzene	<6.0	ug/Kg		
Chloroethane	<6.0	ug/Kg		
2-Chloroethylvinyl ether	<6.0	ug/Kg		
Chloroform	<6.0	ug/Kg		
Chloromethane	<6.0	ug/Kg		
Dibromochloromethane	<6.0	ug/Kg		
1,2-Dichlorobenzene	<6.0	ug/Kg		
1,3-Dichlorobenzene	<6.0	ug/Kg		
1,4-Dichlorobenzene	<6.0	ug/Kg		
1,1-Dichloroethane	<6.0	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg		
1,1-Dichloroethene	<6.0	ug/Kg		
trans-1,2-Dichloroethene	<6.0	ug/Kg		
1,2-Dichloropropane	<6.0	ug/Kg		
cis-1,3-Dichloropropene	<6.0	ug/Kg		
trans-1,3-Dichloropropene	<6.0	ug/Kg		
Ethylbenzene	<6.0	ug/Kg		
2-Hexanone	<6.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
Methylene Chloride	<6.0	ug/Kg		
Styrene	<6.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg		
Tetrachloroethene	<6.0	ug/Kg		
Toluene	<6.0	ug/Kg		
1,1,1-Trichloroethane	<6.0	ug/Kg		
1,1,2-Trichloroethane	<6.0	ug/Kg		
Trichloroethene	<6.0	ug/Kg		
Trichlorofluoromethane	<6.0	ug/Kg		
Vinyl Acetate	<6.0	ug/Kg		
Vinyl Chloride	<6.0	ug/Kg		
m-Xylene	<6.0	ug/Kg		
o-Xylene	<6.0	ug/Kg		
p-Xylene	<6.0	ug/Kg		

NET Cambridge Divisior.
ANALYTICAL REPORT

›ort Date: 11/10/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Date Rec'd: 11/02/1992

Sample ID: CV-92-0528-W44

NET Sample No: 68794

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<6.0	ug/Kg	11/05/1992	dhg
Benzene	<6.0	ug/Kg		
Bromodichloromethane	<6.0	ug/Kg		
Bromoform	<6.0	ug/Kg		
Bromomethane	<6.0	ug/Kg		
2-Butanone (MEK)	<6.0	ug/Kg		
Carbon Disulfide	<6.0	ug/Kg		
Carbon Tetrachloride	<6.0	ug/Kg		
Chlorobenzene	<6.0	ug/Kg		
Chloroethane	<6.0	ug/Kg		
2-Chloroethylvinyl ether	<6.0	ug/Kg		
Chloroform	<6.0	ug/Kg		
Chloromethane	<6.0	ug/Kg		
Dibromochloromethane	<6.0	ug/Kg		
1,2-Dichlorobenzene	<6.0	ug/Kg		
1,3-Dichlorobenzene	<6.0	ug/Kg		
1,4-Dichlorobenzene	<6.0	ug/Kg		
1,1-Dichloroethane	<6.0	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg		
1,1-Dichloroethene	<6.0	ug/Kg		
trans-1,2-Dichloroethene	<6.0	ug/Kg		
1,2-Dichloropropane	<6.0	ug/Kg		
cis-1,3-Dichloropropene	<6.0	ug/Kg		
trans-1,3-Dichloropropene	<6.0	ug/Kg		
Ethylbenzene	<6.0	ug/Kg		
2-Hexanone	<6.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
Methylene Chloride	<6.0	ug/Kg		
Styrene	<6.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg		
Tetrachloroethene	<6.0	ug/Kg		
Toluene	<6.0	ug/Kg		
1,1,1-Trichloroethane	<6.0	ug/Kg		
1,1,2-Trichloroethane	<6.0	ug/Kg		
Trichloroethene	<6.0	ug/Kg		
Trichlorofluoromethane	<6.0	ug/Kg		
Vinyl Acetate	<6.0	ug/Kg		
Vinyl Chloride	<6.0	ug/Kg		
m-Xylene	<6.0	ug/Kg		
o-Xylene	<6.0	ug/Kg		
p-Xylene	<6.0	ug/Kg		

NET Cambridge Division
ANALYTICAL REPORT

›ort Date: 11/10/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Date Rec'd: 11/02/1992

Sample ID: CV-92-0529-FBW

NET Sample No: 68795

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 624 AQ				
Acetone	<5.0	ug/L	11/04/1992	cdl
Benzene	<5.0	ug/L		
Bromodichloromethane	<5.0	ug/L		
Bromoform	<5.0	ug/L		
Bromomethane	<5.0	ug/L		
2-Butanone (MEK)	<5.0	ug/L		
Carbon Disulfide	<5.0	ug/L		
Carbon Tetrachloride	<5.0	ug/L		
Chlorobenzene	<5.0	ug/L		
Chloroethane	<5.0	ug/L		
2-Chloroethylvinyl ether	<5.0	ug/L		
Chloroform	<5.0	ug/L		
Chloromethane	<5.0	ug/L		
Dibromochloromethane	<5.0	ug/L		
1,2-Dichlorobenzene	<5.0	ug/L		
1,3-Dichlorobenzene	<5.0	ug/L		
1,4-Dichlorobenzene	<5.0	ug/L		
1,1-Dichloroethane	<5.0	ug/L		
1,2-Dichloroethane	<5.0	ug/L		
1,1-Dichloroethene	<5.0	ug/L		
trans-1,2-Dichloroethene	<5.0	ug/L		
1,2-Dichloropropane	<5.0	ug/L		
cis-1,3-Dichloropropene	<5.0	ug/L		
trans-1,3-Dichloropropene	<5.0	ug/L		
Ethylbenzene	<5.0	ug/L		
2-Hexanone	<5.0	ug/L		
4-Methyl-2-pentanone (MIBK	<5.0	ug/L		
Methylene Chloride	<5.0	ug/L		
Styrene	<5.0	ug/L		
1,1,2,2-Tetrachloroethane	<5.0	ug/L		
Tetrachloroethene	<5.0	ug/L		
Toluene	<5.0	ug/L		
1,1,1-Trichloroethane	<5.0	ug/L		
1,1,2-Trichloroethane	<5.0	ug/L		
Trichloroethene	<5.0	ug/L		
Trichlorofluoromethane	<5.0	ug/L		
Vinyl Acetate	<5.0	ug/L		
Vinyl Chloride	<5.0	ug/L		
m-Xylene	<5.0	ug/L		
o-Xylene	<5.0	ug/L		
p-Xylene	<5.0	ug/L		

NET Cambridge Division

QUALITY CONTROL DATA

Client: ICF Kaiser Engineers — NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs — Report Date: 11/10/1992

Surrogate Standard Percent Recovery

Abbreviated Surrogate Standard Names:

SS1	SS2	SS3	SS4	SS5	SS6	SS7	SS8	SS9	SS10	SS11	SS12
Bromofl	1,2-Dic	Toluene	Bromofl	1,2-Dic	Toluene						

Sample ID	NET ID	Matrix	SS1	SS2	SS3	SS4	SS5	SS6	SS7	SS8	SS9	SS10	SS11	SS12
						Percent Recovery								
CV-92-0524-I24	68790	SOIL				76	81	95						
CV-92-0525-I45	68791	SOIL				85	88	119						
CV-92-0526-S100	68792	SOIL				86	98	111						
CV-92-0527-W6	68793	SOIL				88	78	93						
CV-92-0528-W44	68794	SOIL				82	96	115						
CV-92-0529-FBW	68795	BLANK	107	100	95									

Notes:
NR - This surrogate standard is Not Required. Other versions of this test method may use this surrogate standard.
Dil - This surrogate standard was diluted to below detectable levels due to concentrations of analytes in this sample.

Complete Surrogate Standard Names Listed by Analysis:

Pesticide Surrogate Standards:
Decachl = Decachlorobiphenyl — Dibutyl = Dibutylchlorendate — Tetrach = Tetrachloro-m-xylene

Volatile Surrogate Standards:
Bromofl = Bromofluorobenzene — 1,2-Dichl = 1,2-Dichloroethane-d4 — Toluene = Toluene-d8

Drinking Water Method 524 1,2-Dichl = 1,2-Dichlorobenzene-d4

Semivolatlile Surrogate Standards:
2-Fluor (1st) = 2-Fluorobiphenyl — Phenol- = Phenol-d6 — 2,4,6-T = 2,4,6-Tribromophenol
2-Fluor (2nd) = 2-Fluorophenol — Nitrobe = Nitrobenzene-d5 — p-Terph = p-Terphenyl

Herbicides Surrogate Standard:
2,4-Dic = 2,4-Dichlorophenyl acetic acid

Petroleum Hydrocarbon Fingerprint Surrogate Standard:
2-Fluor = 2-Fluorobiphenyl — para-Te = para-Terphynyl

NET Cambridge Division
QUALITY CONTROL DATA

Report To: ICF Kaiser Engineers | NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs | Report Date : 11/10/1992

Method Blank Analysis Data

Test Name	Result	Units	Run Batch	Run Date	Analyst Initials
TCL Volatiles by GC/MS 8240 S					
Bromofluorobenzene	108	% recov.	281	11/05/1992	dhg
1,2-Dichloroethane-d4	102	% recov.	281	11/05/1992	dhg
Toluene-d8	107	% recov.	281	11/05/1992	dhg
Acetone	<5.0	ug/Kg	281	11/05/1992	dhg
Benzene	<5.0	ug/Kg	281	11/05/1992	dhg
Bromodichloromethane	<5.0	ug/Kg	281	11/05/1992	dhg
Bromoform	<5.0	ug/Kg	281	11/05/1992	dhg
Bromomethane	<5.0	ug/Kg	281	11/05/1992	dhg
2-Butanone (MEK)	<5.0	ug/Kg	281	11/05/1992	dhg
Carbon Disulfide	<5.0	ug/Kg	281	11/05/1992	dhg
Carbon Tetrachloride	<5.0	ug/Kg	281	11/05/1992	dhg
Chlorobenzene	<5.0	ug/Kg	281	11/05/1992	dhg
Chloroethane	<5.0	ug/Kg	281	11/05/1992	dhg
2-Chloroethylvinyl ether	<5.0	ug/Kg	281	11/05/1992	dhg
Chloroform	<5.0	ug/Kg	281	11/05/1992	dhg
Chloromethane	<5.0	ug/Kg	281	11/05/1992	dhg
Dibromochloromethane	<5.0	ug/Kg	281	11/05/1992	dhg
1,2-Dichlorobenzene	<5.0	ug/Kg	281	11/05/1992	dhg
1,3-Dichlorobenzene	<5.0	ug/Kg	281	11/05/1992	dhg
1,4-Dichlorobenzene	<5.0	ug/Kg	281	11/05/1992	dhg
1,1-Dichloroethane	<5.0	ug/Kg	281	11/05/1992	dhg
1,2-Dichloroethane	<5.0	ug/Kg	281	11/05/1992	dhg
1,1-Dichloroethene	<5.0	ug/Kg	281	11/05/1992	dhg
trans-1,2-Dichloroethene	<5.0	ug/Kg	281	11/05/1992	dhg
1,2-Dichloropropane	<5.0	ug/Kg	281	11/05/1992	dhg
cis-1,3-Dichloropropene	<5.0	ug/Kg	281	11/05/1992	dhg
trans-1,3-Dichloropropene	<5.0	ug/Kg	281	11/05/1992	dhg
Ethylbenzene	<5.0	ug/Kg	281	11/05/1992	dhg
2-Hexanone	<5.0	ug/Kg	281	11/05/1992	dhg
4-Methyl-2-pentanone (MIBK	<5.0	ug/Kg	281	11/05/1992	dhg
Methylene Chloride	<5.0	ug/Kg	281	11/05/1992	dhg
Styrene	<5.0	ug/Kg	281	11/05/1992	dhg
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg	281	11/05/1992	dhg
Tetrachloroethene	<5.0	ug/Kg	281	11/05/1992	dhg
Toluene	<5.0	ug/Kg	281	11/05/1992	dhg
1,1,1-Trichloroethane	<5.0	ug/Kg	281	11/05/1992	dhg
1,1,2-Trichloroethane	<5.0	ug/Kg	281	11/05/1992	dhg
Trichloroethene	<5.0	ug/Kg	281	11/05/1992	dhg
Trichlorofluoromethane	<5.0	ug/Kg	281	11/05/1992	dhg
Vinyl Acetate	<5.0	ug/Kg	281	11/05/1992	dhg
Vinyl Chloride	<5.0	ug/Kg	281	11/05/1992	dhg
m-Xylene	<5.0	ug/Kg	281	11/05/1992	dhg
o-Xylene	<5.0	ug/Kg	281	11/05/1992	dhg
p-Xylene	<5.0	ug/Kg	281	11/05/1992	dhg

NET Cambridge Division
QUALITY CONTROL DATA

Report To: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Report Date : 11/10/1992

Method Blank Analysis Data

Test Name	Result	Units	Run Batch	Run Date	Analyst Initials
TCL Volatiles by GC/MS 8240 S					
Bromofluorobenzene	107	% recov.	283	11/08/1992	dhg
1,2-Dichloroethane-d4	91	% recov.	283	11/08/1992	dhg
Toluene-d8	110	% recov.	283	11/08/1992	dhg
Acetone	<5.0	ug/Kg	283	11/08/1992	dhg
Benzene	<5.0	ug/Kg	283	11/08/1992	dhg
Bromodichloromethane	<5.0	ug/Kg	283	11/08/1992	dhg
Bromoform	<5.0	ug/Kg	283	11/08/1992	dhg
Bromomethane	<5.0	ug/Kg	283	11/08/1992	dhg
2-Butanone (MEK)	<5.0	ug/Kg	283	11/08/1992	dhg
Carbon Disulfide	<5.0	ug/Kg	283	11/08/1992	dhg
Carbon Tetrachloride	<5.0	ug/Kg	283	11/08/1992	dhg
Chlorobenzene	<5.0	ug/Kg	283	11/08/1992	dhg
Chloroethane	<5.0	ug/Kg	283	11/08/1992	dhg
2-Chloroethylvinyl ether	<5.0	ug/Kg	283	11/08/1992	dhg
Chloroform	<5.0	ug/Kg	283	11/08/1992	dhg
Chloromethane	<5.0	ug/Kg	283	11/08/1992	dhg
Dibromochloromethane	<5.0	ug/Kg	283	11/08/1992	dhg
1,2-Dichlorobenzene	<5.0	ug/Kg	283	11/08/1992	dhg
1,3-Dichlorobenzene	<5.0	ug/Kg	283	11/08/1992	dhg
1,4-Dichlorobenzene	<5.0	ug/Kg	283	11/08/1992	dhg
1,1-Dichloroethane	<5.0	ug/Kg	283	11/08/1992	dhg
1,2-Dichloroethane	<5.0	ug/Kg	283	11/08/1992	dhg
1,1-Dichloroethene	<5.0	ug/Kg	283	11/08/1992	dhg
trans-1,2-Dichloroethene	<5.0	ug/Kg	283	11/08/1992	dhg
1,2-Dichloropropane	<5.0	ug/Kg	283	11/08/1992	dhg
cis-1,3-Dichloropropene	<5.0	ug/Kg	283	11/08/1992	dhg
trans-1,3-Dichloropropene	<5.0	ug/Kg	283	11/08/1992	dhg
Ethylbenzene	<5.0	ug/Kg	283	11/08/1992	dhg
2-Hexanone	<5.0	ug/Kg	283	11/08/1992	dhg
4-Methyl-2-pentanone (MIBK	<5.0	ug/Kg	283	11/08/1992	dhg
Methylene Chloride	<5.0	ug/Kg	283	11/08/1992	dhg
Styrene	<5.0	ug/Kg	283	11/08/1992	dhg
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg	283	11/08/1992	dhg
Tetrachloroethene	<5.0	ug/Kg	283	11/08/1992	dhg
Toluene	<5.0	ug/Kg	283	11/08/1992	dhg
1,1,1-Trichloroethane	<5.0	ug/Kg	283	11/08/1992	dhg
1,1,2-Trichloroethane	<5.0	ug/Kg	283	11/08/1992	dhg
Trichloroethene	<5.0	ug/Kg	283	11/08/1992	dhg
Trichlorofluoromethane	<5.0	ug/Kg	283	11/08/1992	dhg
Vinyl Acetate	<5.0	ug/Kg	283	11/08/1992	dhg
Vinyl Chloride	<5.0	ug/Kg	283	11/08/1992	dhg
m-Xylene	<5.0	ug/Kg	283	11/08/1992	dhg
o-Xylene	<5.0	ug/Kg	283	11/08/1992	dhg
p-Xylene	<5.0	ug/Kg	283	11/08/1992	dhg

NET Cambridge Division
QUALITY CONTROL DATA

Report To: ICF Kaiser Engineers NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs Report Date : 11/10/1992

Method Blank Analysis Data

Test Name	Result	Units	Run Batch	Run Date	Analyst Initials
TCL Volatiles by GC/MS 624 AQ					
Bromofluorobenzene	111	% recov.	846	11/04/1992	cdl
1,2-Dichloroethane-d4	99	% recov.	846	11/04/1992	cdl
Toluene-d8	108	% recov.	846	11/04/1992	cdl
Acetone	<5.0	ug/L	846	11/04/1992	cdl
Benzene	<5.0	ug/L	846	11/04/1992	cdl
Bromodichloromethane	<5.0	ug/L	846	11/04/1992	cdl
Bromoform	<5.0	ug/L	846	11/04/1992	cdl
Bromomethane	<5.0	ug/L	846	11/04/1992	cdl
2-Butanone (MEK)	<5.0	ug/L	846	11/04/1992	cdl
Carbon Disulfide	<5.0	ug/L	846	11/04/1992	cdl
Carbon Tetrachloride	<5.0	ug/L	846	11/04/1992	cdl
Chlorobenzene	<5.0	ug/L	846	11/04/1992	cdl
Chloroethane	<5.0	ug/L	846	11/04/1992	cdl
2-Chloroethylvinyl ether	<5.0	ug/L	846	11/04/1992	cdl
Chloroform	<5.0	ug/L	846	11/04/1992	cdl
Chloromethane	<5.0	ug/L	846	11/04/1992	cdl
Dibromochloromethane	<5.0	ug/L	846	11/04/1992	cdl
1,2-Dichlorobenzene	<5.0	ug/L	846	11/04/1992	cdl
1,3-Dichlorobenzene	<5.0	ug/L	846	11/04/1992	cdl
1,4-Dichlorobenzene	<5.0	ug/L	846	11/04/1992	cdl
1,1-Dichloroethane	<5.0	ug/L	846	11/04/1992	cdl
1,2-Dichloroethane	<5.0	ug/L	846	11/04/1992	cdl
1,1-Dichloroethene	<5.0	ug/L	846	11/04/1992	cdl
trans-1,2-Dichloroethene	<5.0	ug/L	846	11/04/1992	cdl
1,2-Dichloropropane	<5.0	ug/L	846	11/04/1992	cdl
cis-1,3-Dichloropropene	<5.0	ug/L	846	11/04/1992	cdl
trans-1,3-Dichloropropene	<5.0	ug/L	846	11/04/1992	cdl
Ethylbenzene	<5.0	ug/L	846	11/04/1992	cdl
2-Hexanone	<5.0	ug/L	846	11/04/1992	cdl
4-Methyl-2-pentanone (MIBK	<5.0	ug/L	846	11/04/1992	cdl
Methylene Chloride	<5.0	ug/L	846	11/04/1992	cdl
Styrene	<5.0	ug/L	846	11/04/1992	cdl
1,1,2,2-Tetrachloroethane	<5.0	ug/L	846	11/04/1992	cdl
Tetrachloroethene	<5.0	ug/L	846	11/04/1992	cdl
Toluene	<5.0	ug/L	846	11/04/1992	cdl
1,1,1-Trichloroethane	<5.0	ug/L	846	11/04/1992	cdl
1,1,2-Trichloroethane	<5.0	ug/L	846	11/04/1992	cdl
Trichloroethene	<5.0	ug/L	846	11/04/1992	cdl
Trichlorofluoromethane	<5.0	ug/L	846	11/04/1992	cdl
Vinyl Acetate	<5.0	ug/L	846	11/04/1992	cdl
Vinyl Chloride	<5.0	ug/L	846	11/04/1992	cdl
m-Xylene	<5.0	ug/L	846	11/04/1992	cdl
o-Xylene	<5.0	ug/L	846	11/04/1992	cdl
p-Xylene	<5.0	ug/L	846	11/04/1992	cdl

NET Cambridge Division
QUALITY CONTROL DATA

Report To: ICF Kaiser Engineers NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs Report Date: 11/10/1992

Matrix Spike/Matrix Spike Duplicate Results

Compound	Spike Amount	Sample Result	Units	MS Result	MS % Recovery	MSD Result	MSD % Recovery	RPD
TCL Volatiles by GC/MS 8240 S								
Acetone	0.0	<5.0	ug/Kg					
Benzene	50.0	<5.0	ug/Kg	54.1	108.20	45.2	90.40	17.80
Bromodichloromethane	0.0	<5.0	ug/Kg					
Bromoform	0.0	<5.0	ug/Kg					
Bromomethane	0.0	<5.0	ug/Kg					
2-Butanone (MEK)	0.0	<5.0	ug/Kg					
Carbon Disulfide	0.0	<5.0	ug/Kg					
Carbon Tetrachloride	0.0	<5.0	ug/Kg					
Chlorobenzene	50.0	<5.0	ug/Kg	47.4	94.80	38.8	77.60	20.00
Chloroethane	0.0	<5.0	ug/Kg					
2-Chloroethylvinyl ether	0.0	<5.0	ug/Kg					
Chloroform	0.0	<5.0	ug/Kg					
Chloromethane	0.0	<5.0	ug/Kg					
Dibromochloromethane	0.0	<5.0	ug/Kg					
1,2-Dichlorobenzene	0.0	<5.0	ug/Kg					
1,3-Dichlorobenzene	0.0	<5.0	ug/Kg					
1,4-Dichlorobenzene	0.0	<5.0	ug/Kg					
1,1-Dichloroethane	0.0	<5.0	ug/Kg					
1,2-Dichloroethane	0.0	<5.0	ug/Kg					
1,1-Dichloroethene	54.3	12	ug/Kg	66	99.40	43.8	58.60	51.60
trans-1,2-Dichloroethene	0.0	<5.0	ug/Kg					
1,2-Dichloropropane	0.0	<5.0	ug/Kg					
cis-1,3-Dichloropropene	0.0	<5.0	ug/Kg					
trans-1,3-Dichloropropene	0.0	<5.0	ug/Kg					
Ethylbenzene	0.0	<5.0	ug/Kg					
2-Hexanone	0.0	<5.0	ug/Kg					
4-Methyl-2-pentanone (MIBK	0.0	<5.0	ug/Kg					
Methylene Chloride	0.0	<5.0	ug/Kg					
Styrene	0.0	<5.0	ug/Kg					
1,1,2,2-Tetrachloroethane	0.0	<5.0	ug/Kg					
Tetrachloroethene	0.0	<5.0	ug/Kg					
Toluene	50.0	<5.0	ug/Kg	61.0	122.00	45.6	91.20	28.80
1,1,1-Trichloroethane	0.0	<5.0	ug/Kg					
1,1,2-Trichloroethane	0.0	<5.0	ug/Kg					
Trichloroethene	50.0	<5.0	ug/Kg	36.7	73.40	31.0	62.00	16.80
Trichlorofluoromethane	0.0	<5.0	ug/Kg					
Vinyl Acetate	0.0	<5.0	ug/Kg					
Vinyl Chloride	0.0	<5.0	ug/Kg					
m-Xylene	0.0	<5.0	ug/Kg					
o-Xylene	0.0	<5.0	ug/Kg					
p-Xylene	0.0	<5.0	ug/Kg					

NOTE: Data reported for spiked samples were analyzed in the same batch, but may not necessarily be that of your sample.

ILF KAISER ENGINEERS

CHAIN OF CUSTODY RECORD 3059

PROJ. NO.	PROJECT NAME
04512-001-00	PPG Circleville RCRA Closure

SAMPLERS: (Signature) A. Douglas Watts Jr.

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	RUSH 5 Day TA						REMARKS
CV-92-0524-I24	10/31/92	1025		X	Incinerator PAD	1	X						Analyze for VOCs using
CV-92-0525-I45	10/31	1040		X	Incinerator PAD	1	X						EPA-SW-846 Method 8240
CV-92-0526-S100	10/31	1108		X	SOUTH PAD	1	X						
CV-92-0527-W4	10/31	1145		X	WEST PAD	1	X						
CV-92-0528-W44	10/31	1130		X	WEST PAD	1	X						
CV-92-0529-FBW	10/31	1155		X	WEST PAD	2	X						

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
A. Douglas Watts Jr.	10/31/92 12:45	To Acrnate Carrier		11/2/92 11:05	[illegible]
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

Appendix D

ATTACHMENT D

PPG Circleville Plant Safety Rules and Instructions

CIRCLEVILLE PLANT SAFETY RULES AND INSTRUCTIONS

1. The PPG Plant in Circleville is a manufacturer of Plastics and Resins. As a result, the products which are most used in the plant are paint thinners and solvents which are highly flammable. The possible presence of solvent vapors must always be considered during all phases of construction. In view of these hazards, the following safety rules are established:

   A. No smoking anywhere on the premises except those areas which are especially designated.

   B. Strike Anywhere Matches (Kitchen Matches) are not allowed in the plant.

   C. No open flames, electric welding, or soldering without permission of the plant Engineering Department. Permissions for an open flame is not permission to smoke. Do not carry flint strikers for gas torches into hazardous areas. Use spark proof tolls and explosion proof equipment where needed. Use safety flashlights only.

   D. Before welding, drilling or use of non-explosive proof equipment, a permit must be secured from the Engineering Office and signed by the Safety Department and Area Supervisor before job can be started.

   E. No use of spark-causing reciprocating equipment; e.g., chisels, saws, hammers, etc., without permission of the Plant Engineering Department.

   F. All equipment must be in first class condition.

   G. Post signs or rope areas off when working overhead.

   H. When announced over P.A. system that additions are being made to the kettles, evacuate 2nd and 3rd floor MR & RD areas until all clear is announced.

   I. Stay clear of areas marked "75-10 in use;" this is a cleaning compounds that makes floors slippery and can cause severe burns.

   J. Ground cables for welding should be attached directly to work piece rather than using plant structure for ground.

   K. Violations of Safety Rules constitute breach of contract and is cause for removal of Contractor. Also constitutes immediate discharge of employee or employees guilty of safety violation.

   L. Do not wear metal soled or heeled shoes or shoes with a metal cap or plate attached.

   M. Do not horseplay.

   N. Do not block fire extinguishers, exists, or alarm boxes.

   O. Do not use packages or drums in place of ladders.

   P. Do not jump from docks, trucks or platforms.

   Q. Eat lunch in lunch area only. We suggest washing the hands before eating.

   R. Report any malfunction or potential safety hazards to your foreman or superintendent.

   S. Housekeeping is part of your job.

2. When cutting into a pipe line or vessel, always know the code number of material that the pipe line or vessel has been used for. If you should accidentally get splashed, remove saturated clothing and flush the affected area of body with water for ten (10) minutes. Do not put saturated clothes or shoes back on unless you are advised to do so. Report incident with code number to your immediate foreman or superintendent and ask him to contact someone from PPG and they will supply information for additional treatment if needed.

3. The parking of contractor's cars or trucks within the plant will not be permitted without approval of the plant Engineering Department.

4. Safety glasses and hard hats must be worn at all times within the fenced area, unless you are in the cafeteria of one of the designated break areas.

5. When a fire alarm sounds, leave work area and go to parking lot until all clear. If you see smoke or fire, turn in alarm and proceed to outside area. Our fire alarm is a horn blast for 10 seconds, followed by a voice annunciation over the public address system identifying the zone of origin. The "All Clear" will be announced orally over the same public address system.

Appendix E

ATTACHMENT E

Risk Assessment

RISK ASSESSMENT

FOR

RCRA PARTIAL CLOSURE

prepared for

PPG INDUSTRIES, INC.
COATINGS AND RESINS DIVISION
Circleville, Ohio

prepared by

ICF KAISER ENGINEERS, INC.
Four Gateway Center
Pittsburgh, Pennsylvania 15222

June 1993

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

List of Figures

List of Tables

TABLE OF CONTENTS (Continued)

List of Tables (Continued)

1.0 INTRODUCTION

This risk assessment was prepared by ICF Kaiser Engineers, Inc. (ICF KE) for PPG Industries, Inc., Coatings and Resins Division, Circleville, Ohio in support of the implementation of the Partial Closure Plan for three interim status hazardous waste management units. This report is prepared in compliance with Ohio EPA's (OEPA) Closure Plan Guidance Manual (1991) despite the fact that some of the required approaches are unachievable under actual conditions. Approaches recommended by the U.S. EPA (1989a; 1989b) are also incorporated. The document is designed to identify non-cancer hazards and theoretical excess lifetime cancer risks associated with current site conditions. As discussed with OEPA, groundwater exposure pathways are not addressed since TCLP results were negative. This document is intended to function as a companion document to the Partial Closure Plan by ICF KE, dated February, 1993. As such, the sampling and analytical data incorporated into this report are derived from that source.

1.1 PURPOSE OF THE RISK ASSESSMENT

Risk assessment is defined as the scientific evaluation of human and environmental health impacts posed by a particular substance or mixture of substances. The purpose of this risk assessment is to provide a quantitative analysis, in a manner consistent with the required approaches of the OEPA, of the likelihood of adverse effects associated with potential residential exposures to chemicals in environmental media in the units.

Specific objectives of this risk assessment are:

- to provide an analysis of baseline risks according to OEPA requirements;
- to provide a basis for determining levels of chemicals that can remain onsite and still be adequately protective of public health; and
- to provide a consistent process of evaluating and documenting public health protective measures.

To achieve these goals, the scientific basis and validity of values incorporated into the assessment are considered and discussed in the context of primary research literature in order to provide a frame of reference for the conclusions.

1.2 APPROACH

The organization of this risk assessment follows the guidelines originally prepared by the National Academy of Sciences (NAS, 1983), which suggest that risk assessments should contain some or all of the following four steps:

- **Hazard Identification (Identification of Chemicals of Concern).** The focus of this step is to evaluate site investigation data, and identify chemicals of concern;

- **Dose-Response Assessment (Toxicity Assessment).** This step involves the determination of the relation between the magnitude of exposure (dose) and the probability of occurrence (response) of adverse health effects associated with the chemicals of concern;

- **Exposure Assessment.** Identification of the receptors likely to be exposed to the chemicals and the extent of their exposure under defined exposure scenarios; and

- **Risk Characterization.** Description of the nature and the magnitude of non-cancer health risk and theoretical excess lifetime cancer risks, including attendant uncertainty, comparisons to typical risks encountered from other sources, and evaluation of the necessity for remedial action.

1.3 REPORT ORGANIZATION

This report is organized in a manner consistent with the above mentioned sections of a risk assessment. The sections of the report are described below:

- Section 1 provides an introduction to the report.

- Section 2 describes the areas of concern at the site and the chemicals of concern in those areas.

- Section 3 describes the theoretical basis for derivation of health criteria for the chemicals of concern and presents the specific health criteria and their bases.

- Section 4 presents the likely human receptors of concern and utilizes defined exposure factors to estimate the magnitude of exposure of those receptors to the chemicals of concern.

- Section 5 presents the results of the analysis in which the risks associated with the defined exposures are quantified and summarized.

- Section 6 describes the uncertainties associated with the exposures and risks calculated.

- Section 7 presents the conclusions of the report.

- Section 8 presents the references used in the report.

2.0 IDENTIFICATION OF CHEMICALS OF CONCERN

This section presents the basis for identification and selection of the chemicals of concern. In addition, the representative concentrations of each of the chemicals of concern and their distribution in each area of concern are also presented.

2.1 SITE BACKGROUND

PPG owns and operates a resin manufacturing facility located on Pittsburgh Road approximately two miles south of Circleville, Pickaway County, Ohio. Resins produced at the facility are used in paints and industrial coatings serving a variety of commercial industries. The surrounding area is classified as industrial and agricultural. Eight major buildings are located on the property of this facility, which encompasses approximately sixty acres. The general topography of the area is flat. The nearest residential development is approximately one-half mile from the plant boundary.

The facility previously was permitted under Interim Status to store wastes in drums and tanks and to treat liquids by incineration. The incinerator operated for approximately seventeen years (1971-1988) and drum storage pads were used for periods of five to twenty-four years. In 1987, a larger incinerator, the Energy Recovery Unit (ERU), began operation at the Circleville facility. The ERU currently receives PPG waste materials from plants in North America and processes them for incineration.

Following the startup and operation of the ERU at the Circleville site, the drum storage pads (West and South pads) and Liquid Waste Incinerator were no longer used. The Liquid Waste Incinerator and the drum storage pads were closed in 1989 in accordance with Interim Status regulatory requirements and as documented in the Partial Closure Plan. Closure of the three units included cleaning or removal of the concrete pads and the underlying soils and removal and disposal of the incinerator.

2.2 DESCRIPTION OF AREAS OF CONCERN

The descriptions of the units are based in part on information contained in the RCRA Interim Status permit and are presented below. The former locations of the Liquid Waste Incinerator, West Pad and South Pad are indicated on Figure 1.

2.2.1 <u>Liquid Waste Incinerator</u>

This unit consisted of a liquid waste incinerator with three lines (two for organic wastes and one for aqueous wastes), which fed wastes to the hearth. The incinerator area included a concrete containment area located southeast of the incinerator pad. Waste characterization for those materials treated in the incinerator included the following:

D001: Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methylisobutyl ketone, methanol, toluene or methyl ethyl ketone);

D001: Aqueous Decanter Waste (aqueous phase byproduct from resin manufacturing process,
D002 containing VOCs and organic acids.
D035

F003: Still sludge including xylene, ethylbenzene and methylisobutyl ketone; and

F005: Still sludge including toluene and methyl ethyl ketone.

The previous Partial Closure Plan submitted to OEPA included methanol as a component of the F003 waste listing. However, the methanol treated at the facility was only associated with the waste resin material (D001).

2.2.2 Drum Storage Area; South Pad

This unit consisted of a flat, packed gravel area approximately 90 feet by 240 feet. This area contained a consolidation platform with a concrete containment pad underneath. The pad had been in use since 1976. Wastes stored in this area included the following:

D001: Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methylisobutyl ketone, methanol, toluene or methyl ethyl ketone).

2.2.3 Drum Storage Area; West Pad

This unit consisted of a flat area covered by packed gravel. The storage pad was approximately 10 feet by 100 feet. This unit was in use from 1975 to 1985. Wastes stored in this area included the following:

D001: Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methylisobutyl ketone, methanol, toluene or methyl ethyl ketone);

F002: Spent methylene chloride.

2.2.4 Drum Storage Area; Still Pad

Still Pad decontamination rinseate sample results were below standards identified in OEPA's Closure Plan Review Guidance. Documentation exists to conclude that the presence of constituents of concern in subsurface soils are not related to RCRA management activities at the Still Pad. During Phase III of PPG's PCB remediation project, the Still Pad as well as contaminated storm sewers and manholes and the surface concrete in the Plant's East yard were removed and replaced.

2.3 DATA COLLECTION

Sampling methods and equipment, as well as laboratory analytical methods, followed U.S. EPA's publication, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846). Soil sampling results from 1989 and 1992 sampling events are included in Appendix A. The results of the sampling and analyses are presented as follows:

2.3.1 Incinerator Area

The soil around the incinerator was tested in 1989 for the constituents listed below. The representative sample points indicated on the sampling grids in this plan were developed using SW-846 protocol and a random number generator. If two points were adjacent, the next number was used. If concrete or a structure interfered with the sample location, the grid next to the location was used. A power auger was used to remove the top four to six inches of soil. The loose soil was removed and a grab sample was collected using a tongue depressor where necessary to loosen the soil. The samples were placed in clean glass 40 milliliter (ml) vials with Teflon septa.

The soil samples were analyzed for the complete Hazardous Substance List (HSL) volatiles according to SW-846 Method 8240. In addition, methanol, n-butanol and isobutanol were analyzed according to SW-846 Methods 5030 and 8015.

2.3.2 South Pad

Analyses for HSL volatile organics and alcohols were performed in 1989 as described in the previous section. Two composite soil samples made up of all 48 soil samples from the area were analyzed for PCBs according to SW-846 Method 8080.

2.3.3 West Pad

Analyses for HSL volatile organics and alcohols were performed in 1989 as described in Section 2.3.1. One composite soil sample made up of all nine soil samples from the area was analyzed for PCBs according to SW-846 Method 8080.

2.3.4 TCLP Data

As agreed with OEPA, four soil samples were collected and analyzed for TCLP on March 24, 1993. Constituents evaluated were ethylbenzene, methylisobutyl ketone, methylene chloride, toluene and xylenes. Each constituent was not detected in each of the samples (limit of detection of each was 25 $\mu g/l$). For this reason, groundwater exposure pathways are not considered further in the risk assessment.

2.4 IDENTIFICATION OF CHEMICALS OF CONCERN

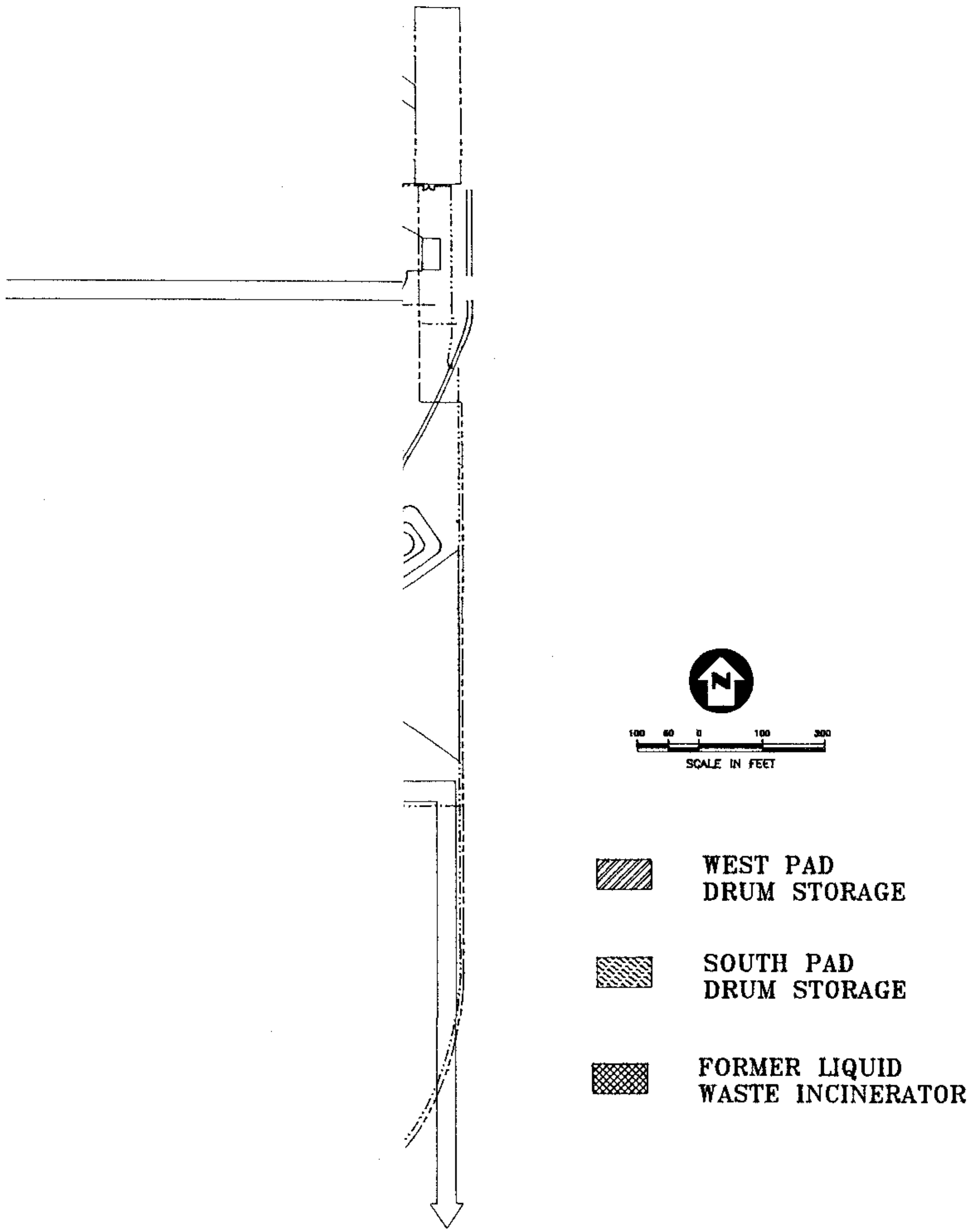
As required by OEPA, chemicals which were detected in each area during the sampling efforts described above were incorporated into this risk assessment. The chemicals of concern for each unit are presented in Table 2-1.

2.5 REPRESENTATIVE CONCENTRATIONS OF CHEMICALS OF CONCERN

As required by OEPA, the representative chemical concentrations for the constituents of concern for use in this risk assessment were taken as the highest detected value in each unit. These values are presented in Table 2-2. As required, the maximum concentration detected at any one grid point was used to quantify the exposure from soil and air in each unit.

JOB NO.: 0451200100 PLOT SCALE: 1=4000

STARTED ON: 12/24/92 REVISED: 2/18/93



REFERENCE: ENGINEERING–SCIENCE
DRAWING CL425.08
SOIL ASSEMENT REPORT
4/24/1991

FIGURE 1

AREAS OF CONCERN FOR PARTIAL RCRA CLOSURE

DATE: 12/24/92	DR.: B. SNYDER
SCALE: N.T.S.	DWG. NO. 04512–B1

TABLE 2-1

SUMMARY OF CHEMICALS OF CONCERN

Area Description	Chemicals of Concern
Incinerator Area	Xylene Ethylbenzene Methylene Chloride
South Pad	Xylene Ethylbenzene Methylisobutyl Ketone (MIBK) Toluene Methylene Chloride
West Pad	Xylene Ethylbenzene Methanol Toluene

See Figure 1 for the location of each area of concern.

TABLE 2-2

MAXIMUM DETECTED CHEMICAL CONCENTRATIONS

CHEMICAL	AREA		
	Incinerator Area	South Pad	West Pad
Xylene	4.0	8.0[1]	2.2
Ethylbenzene	2.0	2.0	0.229
MIBK	ND (<0.005)	0.006	ND[2] (<.005)
Methanol	ND (<.968)	ND (<.968)	.0988
Toluene	ND (<1.90)	21.0	1.34
Methylene Chloride	4.0	3.0	ND (<.300)

1 Values are in parts per million (ppm).

2 ND - Chemical was not detected in this area. Detection limits are listed for non-detects.

3.0 DOSE-RESPONSE ASSESSMENT

Dose-response assessment is the process of characterizing the relationship between the dose of a chemical and the anticipated incidence of an adverse health effect (Preuss and Ehrlich, 1987). The majority of existing knowledge about the dose-response relationship is based on data collected from animal studies (usually rodents) or human occupational exposures, and the theory about what might occur in humans after exposure to environmental doses.

The U.S. EPA has developed dose-response assessment techniques to set "acceptable" levels of human exposure to chemicals in the environment. These U.S. EPA-derived risk criteria address both potential carcinogenic and chronic noncarcinogenic adverse health effects. The following section discusses the derivation of the acceptable dose levels, the manner in which these levels are used in this risk assessment, and the limitations of these values. The limitations are addressed in greater detail in the uncertainty section (Section 6.0).

3.1 BACKGROUND ON NONCARCINOGENIC RESPONSE

It is widely accepted that non-cancer biological effects of chemical substances occur only after a threshold dose is achieved (Klaasen et. al., 1986). For the purposes of establishing non-cancer criteria, this threshold dose is usually estimated from the no observed adverse effect level (NOAEL) or the lowest observed adverse effect level (LOAEL) determined from chronic animal studies. The NOAEL is defined as the highest dose at which no adverse effects occur, while the LOAEL is defined as the lowest dose at which adverse effects are discernable.

NOAELs and LOAELs derived from animal studies or human data are used by the U.S. EPA to establish reference doses (RfDs) for human exposure. An RfD is a dose which is not expected to exceed an acceptable level of noncarcinogenic risk over a set duration of exposure. Uncertainty factors are incorporated into RfDs in an attempt to account for limitations in the quality or quantity of available data.

3.2 ESTIMATING THE LIKELIHOOD OF ADVERSE NONCARCINOGENIC RESPONSE

The dose is the estimated amount of chemical received by the receptor. The relationship between the RfD and the received dose defines the likelihood of occurrence of adverse effects. Doses less than the RfD are not likely to be associated with any adverse health effects and are, generally, not of regulatory concern. Doses which exceed the RfD are considered to present the potential for adverse effects. Values associated with noncarcinogenic exposures are summed at the initial screening level. The relationship is expressed numerically using parameters known as the hazard value (HV) and hazard index (HI). The hazard value is obtained by dividing the average daily dose (ADD) by the RfD as presented below. The ADD is the estimated daily dose of a chemical associated with a situation-specific duration of exposure, which may not necessarily be an entire lifetime.

$$ADD / RfD = HV$$

Each dose calculation, or combination of chemical, receptor, and exposure pathway will have a distinct hazard value. The sum of the HVs for each receptor will yield the HI, as indicated:

$$HVi + HVii + HViii + ... = HI$$

An HI value of less than one indicates that an adverse effect would not be anticipated.

3.3 BACKGROUND ON CARCINOGENIC RESPONSE

The U.S. EPA has typically required that chemicals which are carcinogenic be treated as if minimum thresholds do not exist (U.S. EPA, 1986a, 1986b). The dose-response curve for carcinogens used for regulatory purposes only allows for zero risk at zero dose. Thus, for all doses, some risk is assumed to be present. To estimate the theoretical response at environmental doses, various mathematical dose-response models are used. The accuracy of the projected risk at the low environmental doses is a function of how accurately the mathematical model reflects the relationship between dose and risk at the low dose levels. The U.S. EPA uses the linearized multistage model for low dose extrapolation (Munro and Krewski, 1981). This model assumes that the effect of the carcinogenic agent on tumor formation as seen at high doses in animal data is basically the same at low doses (i.e., the slope of the dose-response curve can be extrapolated downward to the origin in a linear manner).

The U.S. EPA applied the linearized multistage model, as recommended by the Carcinogen Risk Assessment Guidelines (U.S. EPA, 1986b), to develop the upperbound estimate of the risk for the chemicals considered carcinogenic. The numerical expression of carcinogenic potency of a chemical calculated by this method is known as the "Q star", written as Q_1*. The Q_1* usually represents the slope of a dose-response curve derived from animal studies, but may also be based on human epidemiology. The slope is the change in tumor incidence (Y axis) over the change in dose (X axis). Thus, the units in a Q_1* value are tumor incidence over dose level, with dose (the denominator) in milligrams of chemical per kilogram of body weight-day ($Q_1^* = (mg/kg\text{-}day)^{-1}$).

3.4 ESTIMATING THE LIKELIHOOD OF CARCINOGENIC RESPONSE

In order to estimate the theoretical excess lifetime carcinogenic risk associated with exposure to a chemical, the product of the medium-specific (ingestion, inhalation) carcinogenicity slope factor (CSF) and lifetime average daily dose (LADD) estimated for each exposure pathway of concern is determined. The calculation of the theoretical excess lifetime cancer risk is then:

$$LADD \times CSF = Risk.$$

3.5 BENCHMARK VALUES FOR CHEMICALS OF CONCERN

The RfDs and CSFs and descriptions of the principal studies on which they are based are presented below for each of the chemicals of concern found at the site. These values are summarized in Table 3-1 and are based on the most recent U.S. EPA Integrated Risk Information System (IRIS) toxicity assessments (1992a). For MIBK, the values used for the reference doses are based on the Health Effects Assessment Summary Tables (U.S. EPA, 1991, 1992b) since the health risk assessment information contained in IRIS is not finalized.

Principal studies are those that contribute most significantly to the qualitative assessment. Principal studies are of two types: studies of human populations (epidemiologic investigations) and studies using laboratory animals. The presence of human data obviates the necessity of extrapolating from animals to humans. Therefore, human studies, when available, are given first priority. However, for most chemicals, there is a lack of appropriate information on effects in humans. In these cases, the principal studies are drawn from experiments on rats, mice or similar species.

■ METHYLENE CHLORIDE

Methylene chloride has been classified by the U.S. EPA as a probable human carcinogen (Group B2). IRIS (U.S. EPA, 1992a) provides cancer potency estimates for both the oral and inhalation routes of exposure. IRIS also provides an oral reference dose for methylene chloride. The Health Effects Assessment Summary Tables (U.S. EPA, 1992b) provide an inhalation reference concentration.

-- Derivation of the Oral Cancer Slope Factor

IRIS presents the 10^{-6} risk-specific dose of methylene chloride as 7.5×10^{-3} $(mg/kg\text{-}day)^{-1}$. Neither of the studies of chemical factory workers exposed to methylene chloride showed an excess of cancers (Ott et al., 1983; Friendlander et al., 1978; Hearne and Friendlander, 1981). The Ott et al. (1983) study was designed to examine cardiovascular effects, and consequently the study period was too short to allow for latency of site-specific cancers. The Friendlander et al. (1978) study was recently updated to include a larger cohort, followed through 1984, and an investigation of possible confounding factors (Hearne et al., 1986, 1987). A nonsignificant increase in pancreatic cancer deaths was reported. This was interpreted by U.S. EPA (1987) as neither clear evidence of carcinogenicity in humans, nor evidence of noncarcinogenicity. Lifetime exposure at high toxic doses in animal studies have indicated carcinogenic effects from both oral and inhalation exposure to methylene chloride (NCA, 1982, 1983). Two inhalation studies with methylene chloride have reported an increased incidence of benign mammary tumors in both sexes of Sprague-Dawley (Burek et al., 1984) and F344 (NTP, 1986a) rats. Male Sprague-Dawley rats were reported to have increased salivary gland sarcoma (Burek et al., 1984) and female F344 rats were reported to have increased leukemia incidence (NTP, 1986a).

-- Derivation of the Inhalation Cancer Slope Factor

IRIS presents the inhalation unit risk for methylene chloride as 4.7×10^{-7} ug/m^3. Conversion of this factor to an inhalation cancer slope factor yields a value of 1.7×10^{-3} $(mg/kg\text{-}day)^{-1}$. The slope factor was calculated assuming a 70 kg human body weight, 20 m^3 air inhaled per day and 100% absorption of inhaled methylene chloride.

A number of studies have been conducted to determine the potential for carcinogenicity of methylene chloride. The data are equivocal due to varying experimental design and quality, however a number of studies which were conducted for lifetime exposures at high doses have reported positive results (Burek et al., 1984; Dow Chemical Co., 1982).

-- Derivation of the Chronic Oral Reference Dose

The RfD for methylene chloride is 6.0×10^{-2} mg/kg-day (U.S. EPA, 1992a). This value was derived from a 24-month chronic toxicity and oncogenicity study of methylene chloride in rats.

The chosen study was conducted with 85 rats/sex at each of four nominal dose groups (i.e., 5, 50, 125 and 250 mg/kg-day) for 2 years. A high-dose recovery group of 25 rats/sex, as well as two control groups of 85 to 50 rats/sex, was also tested. Many effects were monitored. Treatment related histological alterations of the liver were evident at nominal doses of 50 mg/kg-day or higher. The low nominal dose of 5 mg/kg-day was chosen as the NOAEL (NCA, 1982).

-- **Derivation of the Inhalation Reference Dose**

HEAST (1992) lists a chronic reference concentration for methylene chloride of 3.0 mg/m^3 based on an inhalation study with rats. This concentration was converted to an inhalation reference dose of 0.86 mg/kg-day. This conversion assumes a 70 kg human body weight, 20 m^3 of air inhaled per day and 100% absorption of inhaled methylene chloride. This dose is based on a two year study in which rats were intermittently exposed to methylene chloride in air (Nitschke et al., 1988). The critical effect identified in this study was liver toxicity, and a NOAEL of 694.8 mg/m^3 was established.

■ **XYLENE**

Xylene is not classified as a human carcinogen by the U.S. EPA. IRIS provides an oral reference dose for the evaluation of noncancer health effects.

-- **Derivation of the Chronic Oral Reference Dose**

IRIS (U.S. EPA 1992a) lists an oral reference dose for xylene (xylenes-mixed) as 2.0 mg/kg-day based on an animal study (NTP, 1986b).

Rats and mice were given gavage doses of 0, 250, or 500 mg/kg-day (rats) and 0, 500, or 1000 mg/kg-day (mice) 5 days/week for 103 weeks. The animals were observed for clinical signs of toxicity, body weight gain, and mortality. All animals that died or were killed at sacrifice were given gross necropsy and comprehensive histologic examinations. There was a dose-related increased mortality rate in male rats, and the increase was significantly greater only in the high-dose group as compared with controls. Many of the early deaths were caused by gavage error. There were no compound-related histopathologic lesions in any of the treated rats or mice. Therefore, the high dose was chosen as the LOAEL and the low dose a NOAEL.

IRIS (U.S. EPA, 1992a) does not list an inhalation reference dose for xylene (xylenes-mixed). An inhalation reference dose of 2.0 mg/kg-day was used in this assessment based on the oral reference dose.

■ **ETHYLBENZENE**

Ethylbenzene is not classified as a carcinogen by the U.S. EPA (1992a). IRIS does provide an oral reference dose and inhalation reference concentration for the evaluation of noncancer health effects.

-- **Derivation of the Chronic Oral Reference Dose**

The U.S. EPA Integrated Risk Information System (1992a) lists an oral reference dose for ethylbenzene as 1.0×10^{-1} mg/kg-day based on a subchronic rat oral bioassay (Wolf et. al., 1986).

The chosen study was a rat 182-day oral bioassay in which ethylbenzene was given 5 days/week at doses of 13.6, 136, 408, or 680 mg/kg-day in olive oil gavage. The criteria considered in judging the toxic effects on the test animals were growth, mortality, appearance and behavior, hematologic findings, terminal concentration of urea nitrogen in the blood, final average organ and body weights, histopathologic findings, and bone marrow counts. The LOAEL of 408 mg/kg-day is associated with histopathologic changes in the liver and kidney.

-- **Derivation of the Inhalation Reference Dose**

IRIS lists a reference concentration for ethylbenzene as 1.0 mg/m^3 based on animal inhalation studies. Conversion of this factor to an inhalation reference dose yields a value of 0.29 mg/kg-day. The RfD was calculated assuming a 70 kg human body weight, 20 m^3 of air inhaled per day, and 100% absorption of inhaled ethylbenzene.

Inhalation reproductive toxicity studies were conducted with rats and rabbits exposed 6 to 7 hours/day, 7 days/week during days 1-19 and 1-24 of gestation, respectively, to nominal concentrations of 0, 100, or 1000 ppm (434 or 4342 mg/m^3; Andrew and Bushbom, 1981). A separate group of rats was exposed pregestationally for 3 weeks prior to mating and exposure was continued into the gestational period. The results of the rabbit study led to the selection of a NOAEL of 100 ppm based on a lack of developmental effects in the animals.

■ **METHANOL**

Methanol is not considered a carcinogenic chemical by the U.S. EPA (1992a). IRIS provides an oral reference dose for the evaluation of noncancer health effects.

-- **Derivation of the Chronic Oral Reference Dose**

The U.S. EPA Integrated Risk Information System (1992a) lists an oral reference dose for methanol as 5.0×10^{-1} mg/kg-day based on animal studies. IRIS does not list an inhalation reference dose for methanol. An inhalation reference dose of 5.0×10^{-1} mg/kg-day was used in this risk assessment based on the oral reference dose.

The U.S. EPA Office of Solid Waste, under the RCRA Land Disposal Ban, sponsored the 90-day subchronic testing of methanol in rats (U.S. EPA, 1986c). Rats were gavaged daily with 0, 100, 500, or 2500 mg/kg-day of methanol. There were no differences between dosed animals and controls in body weight gain, food consumption, gross or microscopic evaluations. Elevated levels of SPGT, and increased, but not statistically significant, liver weights in both male and female rats suggest possible treatment-related effects in rats dosed with 2500 mg methanol/kg/day despite the absence of supportive histopathologic lesions in the liver. Based on these findings, 500 mg/kg-day of methanol was selected as a NOAEL in rats.

■ **TOLUENE**

The U.S. EPA has not classified toluene as a human carcinogen. IRIS lists both an oral reference dose and inhalation reference concentration for this chemical.

-- **Derivation of the Chronic Oral Reference Dose**

IRIS (U.S. EPA, 1992a) lists an oral reference dose for toluene as 0.2 mg/kg-day based on a National Toxicology Program study (NTP, 1989).

A subchronic gavage study was conducted in rats. Rats received toluene in corn oil at dosage levels of 0, 312, 625, 1250, 2500, or 5000 mg/kg-day. The NOAEL for this study is 312 mg/kg-day based on liver and kidney weight changes in male rats at 625 mg/kg. Because the exposure was for 5 days/week, this dose is converted to 312 x 5/7 = 223 mg/kg. The LOAEL is 625 mg/kg, which is 446 mg/kg-day when converted.

-- **Derivation of the Inhalation Reference Dose**

IRIS lists an inhalation reference concentration for toluene of 0.4 mg/m^3 based on an occupational study. Conversion of this concentration to an inhalation reference dose yields 0.11 mg/kg-day.

Foo et al. (1990) conducted a cross-sectional study involving 30 exposed female workers employed at an electronic assembly plant where toluene was emitted from glue. Toluene levels reported in the study were from personal monitoring. Exposed workers breathed toluene air levels of 88 ppm and control workers 13 ppm. Eight neurobehavioral tests were administered to all exposed and control workers. Group means revealed statistically significant differences in six out of eight tests; all tests showed that the exposed workers performed poorly compared with the control cohort. Based on the Foo study, a LOAEL of 88 ppm was established based on neurobiological changes from chronic exposure.

■ **METHYLISOBUTYL KETONE (MIBK)**

-- **Derivation of the Chronic Oral Reference Dose**

The Health Effects Assessment Summary Tables (U.S. EPA, 1991, 1992b) list a chronic oral reference dose for methylisobutyl ketone as 5.0×10^{-2} mg/kg-day and an inhalation reference dose as 2.0×10^{-2} mg/kg-day. The oral and inhalation reference doses for MIBK are under review by an EPA work group. Therefore, health risk information contained in IRIS is not currently available. MIBK is not listed as a suspect or defined carcinogen in either IRIS or HEAST.

TABLE 3-1

BENCHMARK VALUES FOR CHEMICALS OF CONCERN

Chemical	Oral Reference Dose (RfD)	Inhalation Reference Dose	Oral Slope Factor	Inhalation Slope Factor
	(mg/kg-day)	(mg/kg-day)	$(mg/kg\text{-}day)^{-1}$	$(mg/kg\text{-}day)^{-1}$
Xylene	2.0 E+0	2.0 E+0[1]	NA[2]	NA
Ethylbenzene	1.0 E-1	2.9 E-1	NA	NA
MIBK	5.0 E-2	2.0 E-2	NA	NA
Methanol	5.0 E-1	5.0 E-1	NA	NA
Toluene	2.0 E-1	1.1 E-1	NA	NA
Methylene Chloride	6.0 E-2	8.6 E-1	7.5 E-3	1.7 E-3

[1] In the absence of an inhalation reference dose, the oral reference dose was used.

[2] NA - Not Applicable; Chemical not considered to be a potential carcinogen by the USEPA.

References: U.S. EPA, 1992a. IRIS (Integrated Risk Information System). U.S. Environmental Protection Agency, Washington, D.C.

U. S. EPA, 1992b. Health Effects Assessment Summary Tables, (HEAST, 1992).

U.S. EPA, 1991. Health Effects Assessment Summary Tables, (HEAST, 1991).

4.0 EXPOSURE ASSESSMENT

Exposure assessment, as defined by the National Academy of Sciences (NAS, 1983), is the process of measuring or estimating the intensity, frequency, and duration of human exposure to an agent in the environment. "In its most complete form, exposure assessment should describe the magnitude, duration, schedule, and route of exposure; the size, nature, and classes of the populations exposed; and the uncertainties in all estimates" (NAS, 1983). Accordingly, this section of the risk assessment discusses the manner in which the chemicals of concern may be distributed in the environment and the estimated frequency of contact between potential human receptors and the chemicals. The quantitative assessment of exposure, based on the chemical concentrations present in the soil or other media of concern, and the degree of absorption of the chemical, provides the basis for estimating chemical uptake (dose) and associated health risks.

4.1 CONCEPT OF DOSE

The "Average Daily Dose" (ADD) or "Lifetime Average Daily Dose" (LADD) of each chemical is the exposure parameter of concern for long-term exposure durations, such as might be considered to occur in the area surrounding the facility. The ADD typically characterizes exposures which are relatively long in duration, such as over a working lifetime. The ADD is used as a standard measure of duration for characterizing long-term noncarcinogenic effects, and does not necessarily incorporate a lifetime duration of exposure. The LADD addresses exposures which may occur over varying durations from a single event to an average 70-year human lifetime. The LADD is an estimate of the daily dose of a chemical associated with any particular exposure situation or duration. The LADD characterizes exposures associated with evaluations of the likelihood of occurrence of carcinogenic endpoints.

4.2 EXPOSURE DOSE AND ABSORPTION

The ADD or LADD that would be received by the receptor is estimated from exposure and absorption. According to the U.S.EPA (1989), exposure is defined as contact of a receptor to a chemical or physical agent. The level of risk associated with exposure to a chemical is always dependent on the degree of systemic absorption or uptake (i.e., dose). Exposure, in this case, is the product of chemical concentrations and medium-specific factors. For example, in the case of inhalation, the medium-specific factor is air volume breathed. The LADD presents the average daily dose (considered absorbed according to U.S.EPA, 1989) of a chemical over the entire 70 year lifetime, considering the fraction of each duration unit, such as a day, week, month, or year. After calculation of the concentrations of the chemical in each medium, the LADD for each chemical received by the receptor due to each route of exposure is calculated.

4.3 PATHWAYS AND ROUTES OF HUMAN EXPOSURE

Exposure pathways are the means through which a receptor may come into contact with a chemical in the environment (e.g., skin contact with soil containing chemicals). An exposure pathway consists of three elements: (1) a source or chemical release from a source, (2) an exposure point of potential human contact, and (3) an exposure route at the contact point. Routes of exposure describe the means through which the chemical gains entry to the body via a particular pathway (e.g., dermal absorption of a soil-bound chemical). An exposure pathway is complete when all three elements are present. In this risk assessment, exposure pathways required by the OEPA are addressed quantitatively. These exceed the typically acceptable selection of exposure pathways. The following sections address the potential pathways and routes of human exposure.

4.3.1 Rationale for Exclusion of Groundwater Exposure Pathways

As agreed with OEPA, four soil samples were collected and analyzed for TCLP on March 24, 1993. Constituents evaluated were ethylbenzene, methyl isobutyl ketone, methylene chloride, toluene and xylenes. Each constituent was not detected in each of the samples (limit of detection of each was 25 μg/l). For this reason, groundwater exposure pathways are not considered further in the risk assessment.

4.4 RECEPTOR AND EXPOSURE PATHWAY SELECTION

The receptors required by OEPA were evaluated in each of the units. These include a residential adult and residential child. The exposure pathways evaluated for each of the receptors were, as required by OEPA, ingestion of soil, dermal contact with soil, inhalation of particulates, and inhalation of volatiles.

4.5 BASIS FOR EXPOSURE FACTORS

Exposure factors used in dose calculations are OEPA required values (OEPA, 1991). Details of the sources of exposure factors are presented below.

4.5.1 Factors Used in All Pathways

The following factors are consistent across the exposure pathways considered in this assessment. The values for the exposure duration and frequency for the pathways considered are as required by OEPA.

Exposure Frequency and Duration. The exposure frequency required by OEPA is 365 days for both an adult and child residential receptor. The exposure duration is 30 years for an adult residential receptor and 6 years for a child residential receptor (OEPA, 1991).

Body Weight. The value for average body weight of an adult is 70 kg and the value for average body weight of a child is 15 kg as required by OEPA (1991).

Averaging Time. The doses for noncarcinogenic health effects are averaged over the specific period of exposure for a given receptor. Noncarcinogenic averaging times are therefore calculated by multiplying the exposure frequency and exposure duration for the receptor. Noncarcinogenic averaging times for the adult and child respectively are 10,950 days and 2,190 days. Potential carcinogenic health effects are calculated over a lifetime of exposure; therefore, the OEPA (1991) value for average lifetime, 70 years, was used resulting in a carcinogenic averaging time of 25,550 days for both adult and child receptors.

4.5.2 Factors Regarding Soil Ingestion

The following factors are incorporated into the exposure calculations of the soil ingestion pathway, as shown in Table 4-1.

Soil Ingestion Rate. Exposure to chemicals in the local environment may typically occur through ingestion of soil. For the majority of persons beyond the age of six, daily uptake of soil due to ingestion will be quite low. For the purposes of estimating exposure in this risk assessment, the OEPA (1991) required value of 100 mg/day was used to describe soil ingestion for residential adults and 200 mg/day for residential children.

4.5.3 Factors Regarding Dermal Contact with Soil

The following factors are incorporated into the exposure calculations of the pathway involving dermal contact with site soils, as presented in Table 4-2.

Skin Surface Area. Skin surface area available for dermal contact with soil for all receptors is as required by OEPA for the scenario for outdoor activities. Exposed skin areas are the arms, hands, and legs for a total of 8,620 cm^2 of exposed skin surface area for a residential adult and 3,535 cm^2 for a residential child (OEPA, 1991).

Soil Adherence Factor. Numerous studies have evaluated the amount of soil that is likely to be in contact with skin. Roels et al. (1980) showed that approximately 1.0 mg of soil per square centimeter of skin adheres to a child's hand after playing in and around the home. Similarly, Driver et al. (1989) reported a reasonable maximum adherence factor of 0.9 mg/cm^2. Despite these, the value used in this risk assessment for describing soil adherence to skin during dermal contact is 2.11 mg/cm^2 as required by OEPA (1991).

4.5.4 Factors Regarding Inhalation of Airborne Particles

The following factors are incorporated into the exposure calculations of the particulate inhalation pathway, as presented in Table 4-3.

Inhalation Rate. OEPA (1991) requires a daily inhalation rate of 20 m^3/day for residential exposures. This gives an average inhalation rate of 0.83 m^3/hour.

Exposure Time. OEPA (1991) requires that both adult and child residential exposures are 24 hours/day for 365 days per year.

4.5.5 Factors Regarding the Inhalation of Volatiles from Soil

The following factors are incorporated into the exposure calculations of the inhalation of volatiles from soils as presented in Table 4-4.

Inhalation Rate. Ohio EPA guidance (1991) provides a daily inhalation rate of 0.83 m^3/hr for residential exposure.

Exposure Time. Ohio EPA guidance (1991) provide a daily exposure time of 24 hours/day.

4.6 CHEMICAL ABSORPTION FACTORS

Chemicals which are contained in a soil matrix and which are contacted by a human receptor are generally not completely absorbed by the receptor. A certain portion of the chemical dose to which the receptor is exposed may not actually be bioavailable. Generally an absorption factor is applied to risk calculations to account for this. Absorption factors may be applicable for gastrointestinal, dermal and respiratory routes of contact. For dermal contact in particular, the amount of chemical actually absorbed through the skin is generally much less than the total chemical dose present in soil contacting the skin. Default absorption factors of 100% have been used for gastrointestinal and respiratory absorption in this risk assessment, even though in many cases, the actual values associated with these factors are far less than 1.0. For the purposes of dermal exposure to contaminated soil, absorption factors of 25% for volatile organic chemicals, 10% for semivolatile organic compounds, and 1% for inorganic compounds (Ryan et al., 1987) are used based on OEPA guidance (1991).

4.7 AIRBORNE PARTICULATE CONCENTRATIONS OF CHEMICALS

Receptors could be exposed through inhalation pathways to chemicals present in the air. This exposure could occur if chemicals contained in a soil matrix are inhaled as soil particulate emissions.

There are two physical phenomena which could produce soil particulate emissions at the site: wind erosion and mechanical disturbances. Wind erosion is typically considered the less significant of these two pathways and even during construction activities contributes only a minor portion to the total particulate emissions from a site (U.S. EPA, 1985). The analysis of potential air exposures assesses constituents migrating from the soils into the atmosphere. OEPA (1991) states that this demonstration should include emission calculations and "safe inhalation levels" based on U.S. EPA and OEPA established exposure levels.

In order to estimate the concentrations of airborne particulates present during construction or digging activities, a theoretical box model was utilized (U.S. EPA, 1973, 1974). The box model is a relatively simple approach which uses conservative assumptions designed to evaluate inhalation exposure to site-associated chemicals. The following conservative assumptions are incorporated into this model:

- The source is infinitely wide in the cross-wind direction;
- The receptor is in the source area at the downwind edge;
- Vertical dispersion has resulted in uniform mixing of the particles from the ground to the breathing zone; and
- No chemicals have dispersed higher than the breathing zone.

Air concentrations of particulates are calculated by assuming the particles enter a box which is the length of the downwind dimension of the area of concern and the height of an average person. The particles in this box are assumed to be uniformly distributed within it and displaced at the downwind end by fresh air moving at a speed WS (a conservative wind speed of 9000 meters/hr or 2.5 m/sec is considered for the assessment).

The box model estimates particle concentrations based on the following equation:

$$PB = GR \; x \; L \; x \; \frac{1}{WS} \; x \; \frac{1}{H}$$

Where: PB = Particle concentration in box (mg/m^3);
GR = Particle generation rate (373 mg/m^2-hr);
L = Downwind length of contaminated area (area specific);
WS = Wind speed (9000 meters/hr); and
H = Height of box (2 meters)

The factors used in the box model calculation are presented in Table 4-5.

In order to calculate the concentration of a specific chemical in the air from the concentration of particulates, a highly conservative approach is incorporated that the concentration of a chemical contained in the airborne particles is the same as the concentration in area soils, as shown in the following equation:

$$CA = PB \; x \; CS \; x \; CF$$

Where: CA = Chemical concentration in airborne particulates (mg/m^3)
PB = Particle concentration in box (mg/m^3)
CS = Chemical concentration in soil (mg/kg)
CF = Conversion factor (10^{-6} kg/mg)

Table 4-6 presents the concentration of chemicals in air as a result of particulate mobilization for each of the site areas.

4.8 SOIL-TO-AIR VOLATILIZATION MODEL

The volatilization factor model (VF) was used for defining the relationship between the concentration of chemicals in soil and the volatilized chemicals in air. This relationship was established as part of the Hwang and Falco (1986) model developed by EPA's Exposure Assessment Group (U.S. EPA, 1986d).

The VF presented in this section assumes that the chemical concentration in the soil is homogeneous from the soil surface to the depth of concern. This calculation is presented in Table 4-7. Factors incorporated into this model are presented in Table 4-8 and the concentration of volatile chemical emissions from soil predicted from this model are presented in Table 4-9.

TABLE 4-1

INGESTION OF CHEMICALS IN SOIL

EXPOSURE FACTORS		
Symbol	Factor	Value
CS	Chemical Concentration in Soil	Area specific (mg/kg)
IR	Ingestion Rate	100 mg/d - adult; 200 mg/d - child
CF	Conversion Factor	10^{-6} kg/mg
FI	Fraction Ingested	1.0 (unitless)
EF	Exposure Frequency	365 days/year
ED	Exposure Duration	30 yrs - adult; 6 yrs - child
BW	Body Weight	70 kg - adult; 15 kg - child
AT	Averaging Time	10,950 day - adult (NC); 2,190 day - child (NC) 25,550 day - adult and child (C)

NC - noncarcinogenic averaging time; C - carcinogenic averaging time

Calculation: Dose (mg/kg-day) = CS x IR x CF x FI x EF x ED x 1/BW x 1/AT

TABLE 4-2

DERMAL CONTACT WITH CHEMICALS IN SOIL

EXPOSURE FACTORS		
Symbol	Factor	Value
CS	Chemical Concentration in Soil	Area specific (mg/kg)
CF	Conversion Factor	10^{-6} kg/mg
SA	Skin Surface Area	8,620 cm^2 - adult; 3,535 cm^2 - child
AF	Adherence Factor	2.11 mg/cm^2
ABS	Absorption Factor	Chemical Specific[1] (unitless)
EF	Exposure Frequency	365 days/year
ED	Exposure Duration	30 yrs - adult; 6 yrs - child
BW	Body Weight	70 kg - adult; 15 kg - child
AT	Averaging Time	10,950 day - adult (NC); 2,190 day - child (NC) 25,550 day - adult and child (C)

NC - noncarcinogenic averaging time; C - carcinogenic averaging time

1 For dermal exposure to chemicals in soil, chemical-specific values are 0.25 for volatile organic compounds, 0.1 for semi-volatile organic compounds, and 0.01 for inorganic compounds (OEPA, 1991; Ryan et. al., 1987).

Calculation: Dose (mg/kg-day) = CS x CF x SA x ABS x AF x EF x ED x 1/BW x 1/AT

TABLE 4-3

INHALATION OF CHEMICALS IN AIRBORNE PARTICULATES

EXPOSURE FACTORS		
Symbol	Factor	Value
CA	Chemical Concentration in Air	Calculated (mg/m^3) with Box Model (See 4.8)
IR	Inhalation Rate	0.83 m^3/hr
ET	Exposure Time	24 hours/day
EF	Exposure Frequency	365 days/year
ED	Exposure Duration	30 yrs - adult; 6 yrs - child
BW	Body Weight	70 kg - adult; 15 kg - child
AT	Averaging Time	10,950 day - adult (NC); 2,190 day - child (NC) 25,550 day - adult and child (C)

NC - noncarcinogenic averaging time; C - carcinogenic averaging time

Calculation: Dose (mg/kg-day) = CA x IR x ET x EF x ED x 1/BW x 1/AT

TABLE 4-4

INHALATION OF VOLATILE CHEMICALS FROM SOIL

EXPOSURE FACTORS		
Symbol	Factor	Value
CA	Chemical Concentration in Air	Calculated using Volatilization Model (see 4.14)
IR	Inhalation Rate	0.833 m^3/hr
ET	Exposure Time	24 hrs/day
EF	Exposure Frequency	365 days/yr
ED	Exposure Duration	30 yrs - adult; 6 yrs - child
BW	Body Weight	70 kg adult; 15 kg child
AT	Averaging Time	10,950 day - adult (NC); 2,190 day - child (NC) 25,550 day - adult and child (C)

NC - noncarcinogenic averaging time; C - carcinogenic averaging time

Calculation: Dose (mg/kg-day) = CA x IR x ET x EF x ED x 1/BW x 1/AT

TABLE 4-5

FACTORS USED IN THE BOX MODEL CALCULATION OF AIRBORNE PARTICULATE CONCENTRATIONS

Symbol	Factor	Value	Comments
GR	Particle Generation Rate	373 mg/m^2 hr	1.2 tons/mo/acre (U.S. EPA, 1985)
L	Length of Area	Incinerator Area = 30.5m South Pad = 85.3m West Pad = 36.6m	Refer to Figure 2-1
WS	Wind Speed	9000 m/hr	Conversion of 2.5 m/sec
H	Height of Box	2m	Approximate height of a person

Particulate Concentration in Air = GR x L x 1/WS x 1/H

Chemical Concentration in Air (mg/m^3) = Particulate Concentration (mg/m^3) x Chemical Concentration in Soil (mg/kg) x 10^{-6} kg/mg.

Example: Incinerator Area, Xylene

Particulate Concentration in Air = 373 mg/m^2hr x 30.5 m x 1/9000 m/hr x 1/2 m = 0.632 mg/m^3

Chemical Concentration in Air = 0.632 mg/m^3 x 4.0 mg/kg x 10^{-6} kg/mg = 2.52 x 10^{-6} mg/m^3

TABLE 4-6

CONCENTRATION OF CHEMICALS IN AIRBORNE PARTICULATES

Chemical	Concentration of Chemical in Soil (mg/kg)	Concentration of Chemical in Airborne Particulates (mg/m^3)
Incinerator Area		
Xylene	4.00	2.52×10^{-6}
Ethylbenzene	2.00	1.27×10^{-6}
Methylene Chloride	4.00	2.52×10^{-6}
South Pad		
Xylene	8.00	1.41×10^{-5}
Ethylbenzene	2.00	3.54×10^{-6}
MIBK	0.006	1.06×10^{-8}
Toluene	21.00	3.71×10^{-5}
Methylene Chloride	3.00	5.30×10^{-6}
West Pad		
Xylene	2.20	1.39×10^{-6}
Ethylbenzene	0.229	1.45×10^{-7}
Methanol	0.988	7.50×10^{-7}
Toluene	1.34	8.47×10^{-7}

Airborne particulate chemical concentrations calculated from the Box Model and soil concentrations; refer to Table 4-5.

TABLE 4-7

SOIL-TO-AIR VOLATILIZATION MODEL CALCULATION

Symbol	Factor (Units)	Value
VF	volatilization factor (m^3/kg)	Chemical and Site Specific
LS	length of side of contaminated area (m)	Incinerator Area = 30.5m; South Pad = 85.3m; West Pad = 36.6m;
V	wind speed in mixing zone (m/sec)	2.5 m/sec
DH	diffusion height (m)	2 m
A	area of contamination (cm^2)	Incinerator Area = 11,152,416 cm^2; South Pad = 31,226,766 cm^2; West Pad = 2,788,104 cm^2;
D_{ei}	effective diffusivity (cm^2/sec)	$D_i \times E^{0.33}$
E	true soil porosity (unitless)	0.35
K_{as}	soil/air partition coefficient (g soil/cm^3 air)	(H/K_d) x 41, where 41 is a units conversion factor
P_s	true soil density or particulate density (g/cm^3)	2.65 g/cm^3
T	exposure interval (sec)	7.9×10^8 sec
D_i	molecular diffusivity (cm^2/sec)	chemical-specific
H	Henry's law constant (atm-m^3/mol)	chemical-specific
K_d	soil-water partition coefficient (cm^3/g)	chemical-specific
K_{oc}	organic carbon partition coefficient (cm^3/g)	chemical-specific
OC	organic carbon content of soil (fraction)	0.031 - Lyman, 1983

Values for E and P_s are from EPA 1988a, and EPA 1988b.

Calculation:

$$VF\ (m^3/kg) = \frac{(LS \times V \times DH)}{A} \times \frac{(3.14 \times \alpha \times T)^{1/2}}{(2 \times D_{ei} \times E \times K_{as} \times 10^{-3}\ kg/g)}$$

where:

$$\alpha\ (cm^2/s) = \frac{(D_{ei} \times E)}{E + (P_s)(1-E)/K_{as}}$$

TABLE 4-8

CHEMICAL-SPECIFIC VALUES INCORPORATED INTO THE SOIL-TO-AIR VOLATILIZATION MODEL

Chemical	D_i	H	K_d	K_{oc}	D_{ei}	K_{as}	α
Toluene	4.2E-05	0.0067	4.681	151	3.0E-05	0.059	3.6E-07
Ethylbenzene	1.5E-06	0.0066	7.967	257	1.0E-06	0.034	7.0E-09
Xylene	5.5E-05	0.0053	49.135	1585	3.8E-05	0.004	3.1E-08
Methanol	1.3E-05	0.0076	3.906	126	8.9E-06	0.080	1.4E-07
MIBK	2.5E-06	0.0043	11.532	372	1.7E-06	0.015	5.3E-09
Methylene Chloride	1.1E-06	0.0020	27.001	871	7.9E-07	0.003	4.8E-10

Factors obtained from Lyman et.al., (1982) Handbook of Chemical Properties; CRC (1990) Handbook of Chemistry and Physics; Perry (1990) Chemical Engineers Handbook; Montgomery and Welkom (1990) Groundwater Chemicals Desk Reference.

TABLE 4-9

CONCENTRATION OF VOLATILE CHEMICAL EMISSIONS FROM SOIL

AREA & CHEMICAL	CONCENTRATION IN SOIL (mg/kg)	VAPOR CONCENTRATION (mg/m^3)
Incinerator Area		
Xylene	4.0	3.0×10^{-6}
Ethylbenzene	2.0	7.1×10^{-7}
Methylene Chloride	4.0	3.7×10^{-7}
South Pad		
Xylene	8.0	7.2×10^{-6}
Ethylbenzene	2.0	8.5×10^{-7}
MIBK	0.006	1.8×10^{-9}
Toluene	21.0	6.4×10^{-5}
Methylene Chloride	3.0	3.3×10^{-7}
West Pad		
Xylene	2.2	4.9×10^{-7}
Ethylbenzene	0.229	2.4×10^{-8}
Methanol	0.988	5.0×10^{-7}
Toluene	1.34	1.0×10^{-6}

5.0 RISK CHARACTERIZATION

Risk characterization is the description of the nature and the magnitude of the potential for occurrence of adverse health effects under a specific set of conditions. In this section the criteria identified in the dose-response assessment (Section 3) are compared with the uptake (dose) values presented in the exposure assessment (Section 4).

The toxicity and exposure assessments are summarized and integrated into quantitative expressions of risk. To characterize potential noncarcinogenic effects, comparisons are made between projected intakes of substances and toxicity values. To characterize potential carcinogenic effects, the theoretical probability that an individual will develop cancer over a lifetime of exposure is estimated from conservative projected intakes and chemical-specific dose-response information. The purpose of risk characterization is to present the data that provide a conclusion with regard to the nature and extent of the risk. This section presents a discussion of the risks calculated for each of the three units.

5.1 APPROACH

For each exposure pathway, theoretical excess lifetime cancer risks were calculated for chemicals of concern which are considered carcinogens by the U.S. EPA (methylene chloride). Hazard values were calculated for all of the chemicals which could potentially pose noncarcinogenic hazards: xylene, ethylbenzene, MIBK, toluene, methanol, and methylene chloride. The noncancer hazard value is based on the assumption that there is a level of exposure below which it is unlikely for even sensitive populations to experience adverse health effects. The individual theoretical excess cancer risk assumes a lifetime of exposure to putative carcinogens.

According to OEPA guidance (1991), carcinogens detected at the site must not exceed the upperbound cancer probability of 1×10^{-6} (one chance in one million for a theoretical extra case of cancer). For summed noncarcinogens detected at the site, the total exposure hazard index is required to be below unity. As required by OEPA, calculated risks were added between hazardous constituents and summed across all routes of exposure for each unit.

5.2 RISK CHARACTERIZATION FOR RECEPTORS AND AREAS OF CONCERN

The results of the risk characterization for each unit are presented below.

The health effects calculation tables are organized in the following manner:

- Tables are in numerical order corresponding to area of concern and receptor as follows: Former Liquid Waste Incineration Area, South Pad and West Pad, residential adult, residential child.

- Tables are also in numerical order corresponding to specific pathway as follows: ingestion of soil, dermal contact with soil, inhalation of particulates, inhalation of volatiles from soil, and combined hazard index and lifetime cancer risks.

5.3 SUMMARY OF POTENTIAL FOR ADVERSE EFFECTS

Table 5-1 presents the summed hazard indices and theoretical excess cancer risks associated with each of the receptors for each unit. Tables 5-2 through 5-7 present the noncancer hazard indices and theoretical excess lifetime cancer risks associated with each exposure pathway and each chemical by unit.

Incinerator Area

Tables 5-8 through 5-12 present the likelihood of adverse effects associated with the residential adult for this area and Tables 5-13 through 5-17 present the likelihood of adverse effects associated with a residential child.

The theoretical excess lifetime cancer risks associated with this area are all lower than the upperbound cancer rate of 1×10^{-6} designated by OEPA (1991) for RCRA closure. For both receptors, the combined hazard index values are lower than the acceptable benchmark of one designated by the U.S. EPA (1989b) and OEPA (1991).

The results for the incinerator area indicate that the summed theoretical excess lifetime cancer risks are 8.84×10^{-7} for the adult and 3.69×10^{-7} for the child. The combined hazard index values are 6.20×10^{-3} and 1.30×10^{-2} for the adult and child, respectively.

South Pad

Tables 5-18 through 5-22 present the likelihood of adverse effects associated with residential adult for this area and Tables 5-23 through 5-2 present the likelihood of adverse effects associated with a residential child.

The theoretical excess lifetime cancer risks associated with this area are all lower than the upperbound cancer rate of 1×10^{-6} designated by OEPA (1991) for RCRA closure. For both receptors, the summed hazard index values are lower than the acceptable benchmark of 1 designated by the U.S. EPA (1989b) and OEPA (1991).

The results for the South Pad area indicate that the summed theoretical excess lifetime cancer risks are 6.62×10^{-7} for adult and 2.77×10^{-7} for the child. The combined hazard index values are 1.42×10^{-2} for the adult and 3.19×10^{-2} for the child.

West Pad

Tables 5-28 through 5-32 present the likelihood of adverse effects associated with the residential adult and Tables 5-33 through 5-37 present the likelihood of adverse effects associated with a residential child.

Theoretical excess lifetime cancer risks were not calculated for this area, since the chemicals of concern were not putative carcinogens. For both receptors the combined hazard index values are lower than the acceptable benchmark of 1 designated by the U.S. EPA (1989b) and OEPA (1991). The results for the West Pad area indicate that the combined hazard index values are 8.57×10^{-4} for the adult and 1.92×10^{-3} for the child.

TABLE 5-1

SUMMARY OF COMBINED HAZARD INDICES AND THEORETICAL EXCESS LIFETIME CANCER RISKS

Receptor/Area	Combined Hazard Index	Theoretical Excess Lifetime Cancer Risks
Adult/Incinerator Area	6.20 E-03	8.84 E-07
Child/Incinerator Area	1.30 E-02	3.69 E-07
Adult/South Pad	1.42 E-02	6.62 E-07
Child/South Pad	3.19 E-02	2.77 E-07
Adult/West Pad	8.57 E-04	NA
Child/West Pad	1.92 E-03	NA

NA - No putitive carcinogenic chemicals detected in this area

TABLE 5-2

NONCANCER HAZARD VALUES AND THEORETICAL EXCESS LIFETIME CANCER RISKS BY CHEMICAL FOR THE INCINERATOR AREA

Chemical	Hypothetical Residential Receptor	Noncancer Hazard Index	Theoretical Excess Lifetime Cancer Risks
Xylene	Adult	1.36E-04	0.00E+00
	Child	2.86E-04	0.00E+00
Ethylbenzene	Adult	1.50E-03	0.00E+00
	Child	3.18E-03	0.00E+00
Methylene Chloride	Adult	4.57E-03	8.84E-07
	Child	9.53E-03	3.69E-07

TABLE 5-3

NONCANCER HAZARD VALUES AND THEORETICAL EXCESS LIFETIME CANCER RISKS BY EXPOSURE PATHWAY FOR THE INCINERATOR AREA

Exposure Pathway	Hypothetical Residential Receptor	Noncancer Hazard Index	Theoretical Excess Lifetime Cancer Risks
Ingestion of Chemicals in Soil	Adult	1.27E-04	1.84E-08
	Child	1.18E-03	3.43E-08
Dermal Contact with Chemicals in Soil	Adult	5.76E-03	8.35E-07
	Child	1.10E-02	3.20E-07
Inhalation of Chemicals on Airborne Particulates	Adult	2.92E-06	6.29E-10
	Child	1.36E-05	5.87E-10
Inhalation of Chemicals from Vapors from Soil	Adult	1.25E-06	7.70E-11
	Child	5.81E-06	7.16E-11

TABLE 5-4

NONCANCER HAZARD VALUES AND THEORETICAL EXCESS LIFETIME CANCER RISKS BY CHEMICAL FOR THE SOUTH PAD

Chemical	Hypothetical Residential Receptor	Noncancer Hazard Index	Theorectical Excess Lifetime Cancer Risks
Xylene	Adult	2.73E-04	0.00E+00
	Child	5.77E-04	0.00E+00
Ethylbenzene	Adult	1.49E-03	0.00E+00
	Child	3.16E-03	0.00E+00
MIBK	Adult	8.96E-06	0.00E+00
	Child	2.00E-05	0.00E+00
Toluene	Adult	9.01E-03	0.00E+00
	Child	2.10E-02	0.00E+00
Methylene Chloride	Adult	3.42E-03	6.62E-07
	Child	7.13E-03	2.77E-07

TABLE 5-5

NONCANCER HAZARD VALUES AND THEORETICAL EXCESS LIFETIME CANCER RISKS BY EXPOSURE PATHWAY FOR THE SOUTH PAD

Exposure Pathway	Hypothetical Residential Receptor	Noncancer Hazard Index	Theoretical Excess Lifetime Cancer Risks
Ingestion of Chemicals in Soil	Adult	2.56E-04	1.38E-08
	Child	2.39E-03	2.57E-08
Dermal Contact with Chemicals in Soil	Adult	1.16E-02	6.26E-07
	Child	2.23E-02	2.40E-07
Inhalation of Chemicals on Airborne Particulates	Adult	1.03E-04	1.10E-09
	Child	4.83E-04	1.03E-09
Inhalation of Chemicals from Vapors from Soil	Adult	1.67E-04	6.93E-11
	Child	7.80E-04	6.47E-11

TABLE 5-6

NONCANCER HAZARD VALUES AND THEORETICAL EXCESS LIFETIME CANCER RISKS BY CHEMICAL FOR THE WEST PAD

Chemical	Hypothetical Residential Receptor	Noncancer Hazard Index	Theorectical Excess Lifetime Cancer Risks
Xylene	Adult	7.44E-05	0.00E+00
	Child	1.56E-04	0.00E+00
Ethylbenzene	Adult	1.65E-04	0.00E+00
	Child	3.48E-04	0.00E+00
Methanol	Adult	8.22E-05	0.00E+00
	Child	2.06E-04	0.00E+00
Toluene	Adult	5.35E-04	0.00E+00
	Child	1.21E-03	0.00E+00

TABLE 5-7

NONCANCER HAZARD VALUES AND THEORETICAL EXCESS LIFETIME CANCER RISKS BY EXPOSURE PATHWAY FOR THE WEST PAD

Exposure Pathway	Hypothetical Residential Receptor	Noncancer Hazard Index	Theorectical Excess Lifetime Cancer Risks
Ingestion of Chemicals in Soil	Adult	1.72E-05	0.00E+00
	Child	1.61E-04	0.00E+00
Dermal Contact with Chemicals in Soil	Adult	7.07E-04	0.00E+00
	Child	1.35E-03	0.00E+00
Inhalation of Chemicals on Airborne Particulates	Adult	3.46E-06	0.00E+00
	Child	1.62E-05	0.00E+00
Inhalation of Chemicals from Vapors from Soil	Adult	3.03E-06	0.00E+00
	Child	1.41E-05	0.00E+00

Residential Adult
Incinerator Area

Table 5-8

Ingestion of Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	4.00E+00	5.71E-06	2.00E+00	2.86E-06	2.45E-06	NA	--
Ethylbenzene	100-41-4	2.00E+00	2.86E-06	1.00E-01	2.86E-05	1.22E-06	NA	--
Methylene Chloride	75-09-2	4.00E+00	5.71E-06	6.00E-02	9.52E-05	2.45E-06	7.50E-03	1.84E-08
Summed:					1.27E-04			1.84E-08

Residential Adult
Incinerator Area

Table 5-9

Dermal Contact with Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	4.00E+00	2.60E-04	2.00E+00	1.30E-04	1.11E-04	NA	--
Ethylbenzene	100-41-4	2.00E+00	1.30E-04	1.00E-01	1.30E-03	5.57E-05	NA	--
Methylene Chloride	75-09-2	4.00E+00	2.60E-04	6.00E-02	4.33E-03	1.11E-04	7.50E-03	8.35E-07
Summed:					5.76E-03			8.35E-07

Residential Adult
Incinerator Area

Table 5-10

Inhalation of Chemicals From Particulates

Compound	CAS No.	Soil Concentration (mg/kg)	Concentration in Suspended Particulates (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	4.00E+00	3.03E-06	8.63E-07	2.00E+00	4.32E-07	3.70E-07	NA	--
Ethylbenzene	100-41-4	2.00E+00	1.52E-06	4.32E-07	2.90E-01	1.49E-06	1.85E-07	NA	--
Methylene Chloride	75-09-2	4.00E+00	3.03E-06	8.63E-07	8.60E-01	1.00E-06	3.70E-07	1.70E-03	6.29E-10
Summed:						2.92E-06			6.29E-10

Residential Adult
Incinerator Area

Table 5-11

Inhalation of Chemicals From Vapors From Soil

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	3.00E-06	8.57E-07	2.00E+00	4.28E-07	3.67E-07	NA	--
Ethylbenzene	100-41-4	7.10E-07	2.03E-07	2.90E-01	6.99E-07	8.69E-08	NA	--
Methylene Chloride	75-09-2	3.70E-07	1.06E-07	8.60E-01	1.23E-07	4.53E-08	1.70E-03	7.70E-11
Summed:					1.25E-06			7.70E-11

Residential Adult
Incinerator Area

Table 5-12

Combined Hazard Index and Lifetime Cancer Risks

Compound	CAS No.	Combined Hazard Index	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	1.36E-04	0.00E+00
Ethylbenzene	100-41-4	1.50E-03	0.00E+00
Methylene Chloride	75-09-2	4.57E-03	8.84E-07
Summed:		6.20E-03	8.84E-07

Residential Child
Incinerator Area

Table 5-13

Ingestion of Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	4.00E+00	5.33E-05	2.00E+00	2.67E-05	4.57E-06	NA	--
Ethylbenzene	100-41-4	2.00E+00	2.67E-05	1.00E-01	2.67E-04	2.29E-06	NA	--
Methylene Chloride	75-09-2	4.00E+00	5.33E-05	6.00E-02	8.89E-04	4.57E-06	7.50E-03	3.43E-08
Summed:					1.18E-03			3.43E-08

Residential Child
Incinerator Area

Table 5-14

Dermal Contact with Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	4.00E+00	4.97E-04	2.00E+00	2.49E-04	4.26E-05	NA	--
Ethylbenzene	100-41-4	2.00E+00	2.49E-04	1.00E-01	2.49E-03	2.13E-05	NA	--
Methylene Chloride	75-09-2	4.00E+00	4.97E-04	6.00E-02	8.29E-03	4.26E-05	7.50E-03	3.20E-07
Summed:					1.10E-02			3.20E-07

Residential Child
Incinerator Area

Table 5-15

Inhalation of Chemicals From Particulates

Compound	CAS No.	Soil Concentration (mg/kg)	Concentration in Suspended Particulates (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	4.00E+00	3.03E-06	4.03E-06	2.00E+00	2.01E-06	3.45E-07	NA	--
Ethylbenzene	100-41-4	2.00E+00	1.52E-06	2.01E-06	2.90E-01	6.95E-06	1.73E-07	NA	--
Methylene Chloride	75-09-2	4.00E+00	3.03E-06	4.03E-06	8.60E-01	4.68E-06	3.45E-07	1.70E-03	5.87E-10
Summed:						1.36E-05			5.87E-10

Residential Child
Incinerator Area

Table 5-16

Inhalation of Chemicals From Vapors From Soil

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	3.00E-06	3.98E-06	2.00E+00	1.99E-06	3.41E-07	NA	--
Ethylbenzene	100-41-4	7.10E-07	9.43E-07	2.90E-01	3.25E-06	8.08E-08	NA	--
Methylene Chloride	75-09-2	3.70E-07	4.91E-07	8.60E-01	5.71E-07	4.21E-08	1.70E-03	7.16E-11
Summed:					5.81E-06			7.16E-11

Residential Child
Incinerator Area

Table 5-17

Combined Hazard Index and Lifetime Cancer Risks

Compound	CAS No.	Combined Hazard Index	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	2.86E-04	0.00E+00
Ethylbenzene	100-41-4	3.18E-03	0.00E+00
Methylene Chloride	75-09-2	9.53E-03	3.69E-07
Summed:		1.30E-02	3.69E-07

Residential Adult
South Pad

Table 5-18

Ingestion of Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	8.00E+00	1.14E-05	2.00E+00	5.71E-06	4.90E-06	NA	--
Ethylbenzene	100-41-4	2.00E+00	2.86E-06	1.00E-01	2.86E-05	1.22E-06	NA	--
MIBK	95-50-1	6.00E-03	8.57E-09	5.00E-02	1.71E-07	3.67E-09	NA	--
Toluene	108-88-3	2.10E+01	3.00E-05	2.00E-01	1.50E-04	1.29E-05	NA	--
Methylene Chloride	75-09-2	3.00E+00	4.29E-06	6.00E-02	7.14E-05	1.84E-06	7.50E-03	1.38E-08
Summed:					2.56E-04			1.38E-08

Residential Adult
South Pad

Table 5-19

Dermal Contact with Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	8.00E+00	5.20E-04	2.00E+00	2.60E-04	2.23E-04	NA	--
Ethylbenzene	100-41-4	2.00E+00	1.30E-04	1.00E-01	1.30E-03	5.57E-05	NA	--
MIBK	95-50-1	6.00E-03	3.90E-07	5.00E-02	7.79E-06	1.67E-07	NA	--
Toluene	108-88-3	2.10E+01	1.36E-03	2.00E-01	6.82E-03	5.85E-04	NA	--
Methylene Chloride	75-09-2	3.00E+00	1.95E-04	6.00E-02	3.25E-03	8.35E-05	7.50E-03	6.26E-07
Summed:					1.16E-02			6.26E-07

Residential Adult
South Pad

Table 5-20

Inhalation of Chemicals From Particulates

Compound	CAS No.	Soil Concentration (mg/kg)	Concentration in Suspended Particulates (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	8.00E+00	1.41E-05	4.02E-06	2.00E+00	2.01E-06	1.72E-06	NA	--
Ethylbenzene	100-41-4	2.00E+00	3.54E-06	1.01E-06	2.90E-01	3.47E-06	4.31E-07	NA	--
MIBK	95-50-1	6.00E-03	1.06E-08	3.02E-09	2.00E-02	1.51E-07	1.29E-09	NA	--
Toluene	108-88-3	2.10E+01	3.71E-05	1.06E-05	1.10E-01	9.60E-05	4.53E-06	NA	--
Methylene Chloride	75-09-2	3.00E+00	5.30E-06	1.51E-06	8.60E-01	1.75E-06	6.47E-07	1.70E-03	1.10E-09
Summed:						1.03E-04			1.10E-09

Residential Adult
South Pad

Table 5-21

Inhalation of Chemicals From Vapors From Soil

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	7.14E-06	2.04E-06	2.00E+00	1.02E-06	8.74E-07	NA	--
Ethylbenzene	100-41-4	8.48E-07	2.42E-07	2.90E-01	8.35E-07	1.04E-07	NA	--
MIBK	95-50-1	1.83E-09	5.23E-10	2.00E-02	2.61E-08	2.24E-10	NA	--
Toluene	108-88-3	6.36E-05	1.82E-05	1.10E-01	1.65E-04	7.78E-06	NA	--
Methylene Chloride	75-09-2	3.33E-07	9.51E-08	8.60E-01	1.11E-07	4.08E-08	1.70E-03	6.93E-11
Summed:					1.67E-04			6.93E-11

Residential Adult
South Pad

Table 5-22

Combined Hazard Index and Lifetime Cancer Risks

Compound	CAS No.	Combined Hazard Index	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	2.73E-04	0.00E+00
Ethylbenzene	100-41-4	1.49E-03	0.00E+00
MIBK	95-50-1	8.96E-06	0.00E+00
Toluene	108-88-3	9.01E-03	0.00E+00
Methylene Chloride	75-09-2	3.42E-03	6.62E-07
Summed:		1.42E-02	6.62E-07

Residential Child
South Pad

Table 5-23

Ingestion of Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	8.00E+00	1.07E-04	2.00E+00	5.33E-05	9.14E-06	NA	--
Ethylbenzene	100-41-4	2.00E+00	2.67E-05	1.00E-01	2.67E-04	2.29E-06	NA	--
MIBK	95-50-1	6.00E-03	8.00E-08	5.00E-02	1.60E-06	6.86E-09	NA	--
Toluene	108-88-3	2.10E+01	2.80E-04	2.00E-01	1.40E-03	2.40E-05	NA	--
Methylene Chloride	75-09-2	3.00E+00	4.00E-05	6.00E-02	6.67E-04	3.43E-06	7.50E-03	2.57E-08
Summed:					2.39E-03			2.57E-08

Residential Child
South Pad

Table 5-24

Dermal Contact with Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	8.00E+00	9.95E-04	2.00E+00	4.97E-04	8.52E-05	NA	--
Ethylbenzene	100-41-4	2.00E+00	2.49E-04	1.00E-01	2.49E-03	2.13E-05	NA	--
MIBK	95-50-1	6.00E-03	7.46E-07	5.00E-02	1.49E-05	6.39E-08	NA	--
Toluene	108-88-3	2.10E+01	2.61E-03	2.00E-01	1.31E-02	2.24E-04	NA	--
Methylene Chloride	75-09-2	3.00E+00	3.73E-04	6.00E-02	6.22E-03	3.20E-05	7.50E-03	2.40E-07
Summed:					2.23E-02			2.40E-07

Residential Child
South Pad

Table 5-25

Inhalation of Chemicals From Particulates

Compound	CAS No.	Soil Concentration (mg/kg)	Concentration in Suspended Particulates (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	8.00E+00	1.41E-05	1.88E-05	2.00E+00	9.39E-06	1.61E-06	NA	--
Ethylbenzene	100-41-4	2.00E+00	3.54E-06	4.69E-06	2.90E-01	1.62E-05	4.02E-07	NA	--
MIBK	95-50-1	6.00E-03	1.06E-08	1.41E-08	2.00E-02	7.04E-07	1.21E-09	NA	--
Toluene	108-88-3	2.10E+01	3.71E-05	4.93E-05	1.10E-01	4.48E-04	4.23E-06	NA	--
Methylene Chloride	75-09-2	3.00E+00	5.30E-06	7.04E-06	8.60E-01	8.19E-06	6.04E-07	1.70E-03	1.03E-09
Summed:						4.83E-04			1.03E-09

Residential Child
South Pad

Table 5-26

Inhalation of Chemicals From Vapors From Soil

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	7.14E-06	9.52E-06	2.00E+00	4.76E-06	8.16E-07	NA	--
Ethylbenzene	100-41-4	8.48E-07	1.13E-06	2.90E-01	3.90E-06	9.69E-08	NA	--
MIBK	95-50-1	1.83E-09	2.44E-09	2.00E-02	1.22E-07	2.09E-10	NA	--
Toluene	108-88-3	6.36E-05	8.48E-05	1.10E-01	7.71E-04	7.27E-06	NA	--
Methylene Chloride	75-09-2	3.33E-07	4.44E-07	8.60E-01	5.16E-07	3.80E-08	1.70E-03	6.47E-11
Summed:					7.80E-04			6.47E-11

Residential Child
South Pad

Table 5-27

Combined Hazard Index and Lifetime Cancer Risks

Compound	CAS No.	Combined Hazard Index	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	5.77E-04	0.00E+00
Ethylbenzene	100-41-4	3.16E-03	0.00E+00
MIBK	95-50-1	2.00E-05	0.00E+00
Toluene	108-88-3	2.10E-02	0.00E+00
Methylene Chloride	75-09-2	7.13E-03	2.77E-07
Summed:		3.19E-02	2.77E-07

Residential Adult
West Pad

Table 5-28

Ingestion of Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	2.20E+00	3.14E-06	2.00E+00	1.57E-06	1.35E-06	NA	--
Ethylbenzene	100-41-4	2.29E-01	3.27E-07	1.00E-01	3.27E-06	1.40E-07	NA	--
Methanol	67-56-1	9.88E-01	1.41E-06	5.00E-01	2.82E-06	6.05E-07	NA	--
Toluene	108-88-3	1.34E+00	1.91E-06	2.00E-01	9.57E-06	8.20E-07	NA	--
Summed:					1.72E-05			0.00E+00

Residential Adult
West Pad

Table 5-29

Dermal Contact with Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	2.20E+00	1.43E-04	2.00E+00	7.15E-05	6.12E-05	NA	--
Ethylbenzene	100-41-4	2.29E-01	1.49E-05	1.00E-01	1.49E-04	6.38E-06	NA	--
Methanol	67-56-1	9.88E-01	2.57E-05	5.00E-01	5.13E-05	1.10E-05	NA	--
Toluene	108-88-3	1.34E+00	8.70E-05	2.00E-01	4.35E-04	3.73E-05	NA	--
Summed:					7.07E-04			0.00E+00

Residential Adult
West Pad

Table 5-30

Inhalation of Chemicals From Particulates

Compound	CAS No.	Soil Concentration (mg/kg)	Concentration in Suspended Particulates (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	2.20E+00	1.67E-06	4.75E-07	2.00E+00	2.37E-07	2.03E-07	NA	--
Ethylbenzene	100-41-4	2.29E-01	1.74E-07	4.94E-08	2.90E-01	1.70E-07	2.12E-08	NA	--
Methanol	67-56-1	9.88E-01	7.49E-07	2.13E-07	5.00E-01	4.26E-07	9.14E-08	NA	--
Toluene	108-88-3	1.34E+00	1.02E-06	2.89E-07	1.10E-01	2.63E-06	1.24E-07	NA	--
Summed:						3.46E-06			0.00E+00

Residential Adult
West Pad

Table 5-31

Inhalation of Chemicals From Vapors From Soil

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	4.90E-07	1.40E-07	2.00E+00	7.00E-08	6.00E-08	NA	--
Ethylbenzene	100-41-4	2.42E-08	6.91E-09	2.90E-01	2.38E-08	2.96E-09	NA	--
Methanol	67-56-1	5.00E-07	1.43E-07	5.00E-01	2.86E-07	6.12E-08	NA	--
Toluene	108-88-3	1.02E-06	2.91E-07	1.10E-01	2.65E-06	1.25E-07	NA	--
Summed:					3.03E-06			0.00E+00

Residential Adult
West Pad

Table 5-32

Combined Hazard Index and Lifetime Cancer Risks

Compound	CAS No.	Combined Hazard Index	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	7.44E-05	0.00E+00
Ethylbenzene	100-41-4	1.65E-04	0.00E+00
Methanol	67-56-1	8.22E-05	0.00E+00
Toluene	108-88-3	5.35E-04	0.00E+00
Summed:		8.57E-04	0.00E+00

Residential Child
West Pad

Table 5-33

Ingestion of Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	2.20E+00	2.93E-05	2.00E+00	1.47E-05	2.51E-06	NA	--
Ethylbenzene	100-41-4	2.29E-01	3.05E-06	1.00E-01	3.05E-05	2.62E-07	NA	--
Methanol	67-56-1	9.88E-01	1.32E-05	5.00E-01	2.63E-05	1.13E-06	NA	--
Toluene	108-88-3	1.34E+00	1.79E-05	2.00E-01	8.93E-05	1.53E-06	NA	--
Summed:					1.61E-04			0.00E+00

Residential Child
West Pad

Table 5-34

Dermal Contact with Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	2.20E+00	2.73E-04	2.00E+00	1.37E-04	2.34E-05	NA	--
Ethylbenzene	100-41-4	2.29E-01	2.85E-05	1.00E-01	2.85E-04	2.44E-06	NA	--
Methanol	67-56-1	9.88E-01	4.91E-05	5.00E-01	9.83E-05	4.21E-06	NA	--
Toluene	108-88-3	1.34E+00	1.67E-04	2.00E-01	8.33E-04	1.43E-05	NA	--
Summed:					1.35E-03			0.00E+00

Residential Child
West Pad

Table 5-35

Inhalation of Chemicals from Particulates

Compound	CAS No.	Soil Concentration (mg/kg)	Concentration in Suspended Particulates (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	2.20E+00	1.67E-06	2.22E-06	2.00E+00	1.11E-06	1.90E-07	NA	--
Ethylbenzene	100-41-4	2.29E-01	1.74E-07	2.31E-07	2.90E-01	7.95E-07	1.98E-08	NA	--
Methanol	67-56-1	9.88E-01	7.49E-07	9.95E-07	5.00E-01	1.99E-06	8.53E-08	NA	--
Toluene	108-88-3	1.34E+00	1.02E-06	1.35E-06	1.10E-01	1.23E-05	1.16E-07	NA	--
Summed:						1.62E-05			0.00E+00

Residential Child
West Pad

Table 5-36

Inhalation of Chemicals From Vapors From Soil

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	4.90E-07	6.53E-07	2.00E+00	3.27E-07	5.60E-08	NA	--
Ethylbenzene	100-41-4	2.42E-08	3.23E-08	2.90E-01	1.11E-07	2.76E-09	NA	--
Methanol	67-56-1	5.00E-07	6.66E-07	5.00E-01	1.33E-06	5.71E-08	NA	--
Toluene	108-88-3	1.02E-06	1.36E-06	1.10E-01	1.24E-05	1.17E-07	NA	--
Summed:					1.41E-05			0.00E+00

Residential Child
West Pad

Table 5-37

Combined Hazard Index and Lifetime Cancer Risks

Compound	CAS No.	Combined Hazard Index	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	1.56E-04	0.00E+00
Ethylbenzene	100-41-4	3.48E-04	0.00E+00
Methanol	67-56-1	2.06E-04	0.00E+00
Toluene	108-88-3	1.21E-03	0.00E+00
Summed:		1.92E-03	0.00E+00

6.0 UNCERTAINTY ANALYSIS

This section qualitatively describes the likelihood that the approaches incorporated into this assessment result in underestimates or overestimates of the risk conclusions. Regulatory risk assessment in general, as it is currently practiced, is highly conservative and often focused on an absolute worst case scenario. The Closure Plan Guidance required by OEPA extends beyond that recommended even by the U.S. EPA in the "Risk Assessment Guidance for Superfund" and implements approaches which would not be reproducible in a real situation. Thus, the risks documented in this report are far in excess of those which would ever be anticipated to actually occur. The specific aspects of this assessment which produce those conclusions are noted below for each aspect of the risk assessment:

<u>Representative Chemical Concentrations:</u> OEPA (1991) requires the use of the highest detected chemical concentration as the representative concentration and the inclusion of any chemical detected above background levels in the risk assessment. This unrealistically conservative approach is in excess of that recommended by the U.S. EPA (1989b) and in excess of that required to meet the National Contingency Plan's stated goal of "protection of public health and the environment" (U.S. EPA, 1986a). The U.S. EPA typically requires the use of the 95% upper confidence limit on the arithmetic mean of a distribution of values, while the actual likelihood of exposure to chemicals is reflected in a geometric mean. The most appropriate description of exposure, and the most reflective of reality, is the use of stochastic methodologies, commonly referred to as "Monte Carlo" modeling.

<u>Likelihood of Hypothetical Residential Land Use Actually Occurring:</u> A critical conceptual aspect of the risk assessment is the assumed future land use. OEPA specifies that a residential setting must be addressed for risk assessment parameters for closure plans (1991). The probability that a residential development would be built on the site 10 or 50 years from now is extremely small, since the current owner has operated the facility for 30 years and intends to continue operations indefinitely.

<u>Exposure Factors:</u> OEPA has required that all chemicals detected in each area and their maximum concentrations be incorporated into the risk assessment. Considering a 30- year residential lifetime, it is difficult to conceive of a situation in which an individual would ingest soil, touch soil, inhale volatiles, inhale particulates every day for that period. Each factor incorporated into the quantitative analysis of those exposures is at or above the 95% upper limit of the range of possible values for that factor. Thus, the hypothetical individual in question is at the 95% level for exposure in every conceivable manner. This exceeds the U.S. EPA's intent to achieve an analysis based on "reasonable maximum exposure" (1989b) and is not consistent with a real possibility for exposure. In addition, the summation of multiple factors at the 95% level leads to a summed conclusion value that is far in excess of 95%, and is likely to reach the 99.99% percentile.

<u>Chemical Fate and Transport:</u> A number of aspects of actual human exposure to chemicals in the environment are not accommodated in OEPA guidance. During a 30 year lifetime of exposure, assuming the chemical source is removed, chemical concentrations in any medium will decrease in a specific location. This may be due to biotic degradation, abiotic degradation, or attenuation (dispersion). The rate of decrease will be due to a multitude of environmental factors such as air, soil, or water conditions, chemical-specific factors such as volatility, solubility, or soil mobility, and physical conditions, such as sunlight. The resulting

lower chemical concentrations will result in lower doses to exposed receptors. In many cases, modeling may incorporate factors to account for this loss, however, it was not incorporated into this assessment.

Dose-Response: Regulatory approaches to risk assessment have required the identification of toxic potency factors for chemicals. For non-carcinogens, a hazard value has been identified on a chemical-specific basis. For putative carcinogens, the "cancer slope factor" has been used to derive an estimate of cancer potency. Because the slope factor is an upper 95th percentile confidence limit of the probability of a response based usually on experimental animal data, the resulting carcinogenic risk estimate will also be an upper-bound estimate. This means that the "true risk" will not exceed the risk estimate derived through the use of this model. This highly conservative approach will safely not produce an underestimate of the risk, however, even the Carcinogen Assessment Group of U.S. EPA (1986b) estimates that the lower limit of risk may be as low as zero. When biological factors are further considered, the best estimate of the risk at very low levels is often zero (Ames, 1987; Ames and Gold, 1991; USOMB, 1991).

7.0 CONCLUSION

The results for the three areas of concern, the Incinerator Area, the South Pad and the West Pad incorporating the selection of chemicals of concern, exposure assessment, dose-response assessment, and risk characterization approaches required by OEPA for RCRA closure, indicate that noncancer hazards and theoretical excess lifetime cancer risks are below the limits established in the Closure Plan Review Guidance Manual by the OEPA (1991), even with the incorporation of the unrealistically conservative approaches required by OEPA. No subsequent evaluation or post-closure monitoring is recommended.

8.0 REFERENCES

Andrew, F.D., R.L. Bushbom (1981), Teratologic Assessment of Ethylbenzene and 2-Ethoxyethanol. Battelle Pacific North West Laboratory, Richland, WA. PB83-208074., 108.

Ames, B. (1987) Six common errors relating to environmental pollution. Reg. Toxicol. Pharmacol. 7:379-383.

Ames, B. and Gold, L. (1991) Cancer prevention strategies greatly exaggerate risk. Chem. Engin. News. January 7, 28-47.

Burek, J.D., K.D. Nitschke, T.J. Bell, et al. (1984) Methylene Chloride: A Two Year Inhalation Toxicity and Oncogenicity Study in Rats and Hamsters. Fund. Appl. Toxicol. 4:30-47.

CRC (1990) Handbook of Chemistry and Physics, 3rd Edition. Lewis Publishers; Chelesa, Michigan.

Driver, J.H., J.J. Konz, G.K. Whitmyre (1989) Soil Adherence to Human Skin. Bull. Environ. Contam. Toxicol. 43(6):814-820.

Dow Chemical Company (1982) Methylene Chloride: A Two-Year Inhalation and Oncogenicity Study in Rats. Toxicology Research Laboratory, Health and Environmental Sciences, DOW Chemical Company, Midland, MI.

Engineering Sciences (1991) PPG Industries, Inc., Circleville, Ohio. Partial Closure Plan.

Foo, S.C., J. Jeyaratnam and D. Koh (1990) Chronic Neurobehavioral Effects of Toluene. Br. J. Prd. Med. 47 (7): 480-484.

Friendlander, B.R., F.T. Hearne and S. Hall (1978) Epidemiologic Investigation of Employees Chronically Exposed to Methylene Chloride. J. Occup. Med. 20(10): 657-666.

Hearne, F.T., F. Brase, J.W. Pifer and B.R. Friendlander (1986) Methylene Chloride Mortality Study Update. Eastman Kodak Company, Rochester, N.Y. June 16.

Hearne, F.T., F. Brase, J.W. Pifer, B.R. Friendlander, and R.L. Raleigh (1987) Methylene Chloride Mortality Study: Dose Response Characterization and Animal Model Comparison. J. Occup. Med. 29(3): 217-228.

Hearne, F.T. and B.R. Friendlander (1981) Follow-Up of Methylene Chloride Study. J. Occup. Med. 23:660.

Hwang, S.T., and J.W. Falco (1986) Estimation of Multimedia Exposure Related to Hazardous Waste Facilities, Cohen, Y. (ed). Plenum Publishing Corp.

Klaasen, C.D., M.O. Amdur, and J. Doull (1986) Casarett and Doull's Toxicology: The Basic Science of Poisions, 3rd edition. Casarett and Doull, eds. MacMillan Publishing, New York.

Munro, I.C. and D.R. Krewski (1981) Risk Assessment and Regulatory Decision-Making. Food Cosmet. Toxical. 19:549-560.

National Academy of Sciences (1983) National Academy of Sciences. Risk Assessment in the Federal Government: Managing the Process. National Academy Press, Washington, D.C.

National Coffee Association (1982) Twenth-Four-Month Chronic Toxicity and Oncogenicity Study of Methylene Chloride in Rats. Final Report. Prepared by Hazeleton Laboratories, America, Inc., Vienna, VA.

National Coffee Association (1983) Twenty-Four-Month Oncogenicity Study of Methylene Chloride in Mice. Final Report. Prepared by Hazelton Laboratories, America, Inc., Vienna, VA.

National Toxicology Program (1986a). Toxicology and Carcinogenesis Studies of Methylene Chloride. NTP-TRS-306.

National Toxicology Program (1986b). Toxicology and Carcinogenesis Studies of Xylenes. NTP TR 327. NIH PB No. 86-2583.

National Toxicology Program (1989). Toxicology and Carcinogenesis Studies of Toluene. Technical Report Series No. 371.

Nitschke, K.D., J.D. Bured, T.J. Bell, et al. (1988) Methylene Chloride: A 2-Year Inhalation Toxicity and Oncogenicity Study in Rats. Fund. Appl. Toxicol. 11:48-59.

Ohio Environmental Protection Agency (1991) Closure Plan Review Guidance. Division of Solid and Hazardous Waste Management.

Ott, M.G., L.K. Skory, B.B. Holder, J.M. Bronson and P.R. Williams (1983) Health Evaluation of Employees Occupationally Exposed to Methylene Chloride. Mortality. Scand. J. Work Environ. 9 (Suppl.1):8-16.

Perry, J.T. (1990) Chemical Engineers Handbook. McGraw-Hill, New York, N.Y.

Preuss, P.W., and A.M. Ehrlich (1987) The Environmental Protection Agency's Risk Assessment Guidelines. Jour. Air Pollution Control Assn. 37:784-791.

Roels, H., J.P. Buchet, R.R. Lauwerys, P. Bruaux, F. Claeys - Thoreau, A. Lafontaine, and G. Verduyn. (1980) Exposure to Lead by the Oral and Pulmonary Routes of Children Living in the Vicinity of a Lead Smelter. Environment 22:81-94.

Ryan, E.A., E.T. Hawkins, B. Magee, S.L. Santos (1987) Assessing Risk From Dermal Exposures at Hazardous Waste Sites. Superfund '87 Proceedings of the 8th National Conference, Nov. 16 - 18, Washington, D.C. Hazardous Materials Control Research Institute.

U.S. EPA (1973) Investigation of Fugitive Dust - Sources, Emissions and Control. NTIS PB-226693.

U.S. EPA (1974) Development of Emission Factors for Fugitive Dust Sources. NTIS PB-238262.

U.S. EPA (1985) Compilation of Air Pollutant Emission Factors. Vol. I: Stationary Point and Area Sources. Fourth Edition. NTIS PB86-124906.

U.S. EPA (1986a) Guidelines for the Health Risk Assessment of Chemical Mixtures. Federal Register 51:34014.

U.S. EPA (1986b) Guidelines for Carcinogen Risk Assessment. Federal Register 51:33992.

U.S. EPA (1986c) Rat Oral Subchronic Toxicity Study with Methanol. Office of Solid Waste, Washington, D.C.

U.S. EPA (1986d) Evaluation and Selecting Models for Estimating Air Emissions from Hazardous Waste Treatment, Storage and Disposal Facilities. Office of Air Quality Planning and Standards. EPA/450/3-86/020.

U.S. EPA (1987) Update to the Health Assessment Document and Addendum for Methylene Chloride: Pharmacokenetics, Mechanism of Action and Epidemiology. Review Draft. Office of Health and Environmental Assessment, Washington, D.C. EPA 1600/8-87/030A.

U.S. EPA (1988a) Estimating Exposures. Office of Health and Environmental Assessment. EPA/600/6-88/005A.

U.S. EPA (1988b) Superfund Exposure Assessment Manual. Office of Emergency and Remedial Response. EPA/540/1-88/001.

U.S. EPA (1989a) Exposure Factors Handbook. Exposure Assessment Group. EPA/600/8-89/043.

U.S. EPA (1989b) Risk Assessment Guidance for Superfund. Volume I. Human Health Evaluation Manual. EPA/540/1-89/002.

U.S. EPA (1991) Health Effects Assessments Summary Tables. Annual FY-1991. Office of Emergency and Remedial Response. NTIS PB91-921199.

U.S. EPA (1992a) Integrated Risk Information System (IRIS). On-line.

U.S. EPA (1992b) Health Effects Assessments Summary Tables. Annual 1992. Office of Emergency and Remedial Response. NTIS PB92-921102.

Wolf, M.A., V.K. Rowe, D.D. McCollister, R.L. Hollingsworth and F. Ogen (1986). Toxicological Studies of Certain Alkylated Benzenes. Arch. Ind. Health. 14:387-398.

Appendix F

ATTACHMENT F

PCB Documentation/Certification

Regarding PPG Industries, Inc. (PPG) Partial Closure Plan for three drum storage areas and the liquid incinerator at the Circleville facility, Ohio EPA issued comments concerning the proposed revision to the Plan in letters dated November 20, 1991 (Comment 2) and dated June 28, 1991 (Comment 2). In order to obtain an approvable closure plan, PPG must demonstrate to Ohio EPA's satisfaction that polychlorinated biphenyl (PCB) levels recorded in these areas are unrelated to RCRA activities, and PPG must provide a statement certifying that none of the hazardous wastes handled at the units contained PCBs.

The results of the PPG's investigation into this matter are organized as follows:

- Since waste characterization is often achieved by knowledge of the process generating the waste, a synopsis of the resin manufacturing process and associated wastes and the relationship of how PCBs were used in the facility is given first.

- The results of the investigation into historical waste analysis reports follows.

- Finally, a summary of analyses of current waste streams consistent with the wastes that were historically stored at the units to be closed is presented.

Resin Manufacturing Process

In the resin manufacturing process, monomers, organic acids, initiators, inhibitors, catalysts, glycols or solvents are combined in a reactor vessel to undergo reactions to form polymers. Some reactions require application of heat to the reactor to produce the desired reaction.

In cases where heat from steam jacketing of the reactor vessel is insufficient, oil is used as a heat transfer media to the reactor jacket because the oil can be heated to a higher temperature than steam. PCB oil (Aroclor 1248) was used for this heat transfer media because of its safety in terms of fire resistance. When the toxicity of PCBs became known, the PCB oil in this system was replaced with non-PCB oil. In early 1972, the hot oil systems at the PPG Circleville facility were drained into a tank truck and the fluid was transported offsite for processing. The systems were flushed with solvent and this material was transferred into a tank truck and transported off site for incineration. Non-PCB heat transfer oil (Therminol 66) was used to fill the systems.

The diagram in Attachment 1 shows an example of the application of the hot oil for heat transfer in the process. When calling for heat on the reactor, hot oil is pumped by the hot oil circulating pump from the furnace through the hot oil piping and through the reactor jacket which is mounted externally to the reactor vessel and then back to the furnace. When the reactor is calling for cooling, the oil flow is diverted by a valve through the cold oil loop. It is cooled in the cool oil fans (air cooled heat exchanger) and recirculated to the reactor jacket.

Another application of heat from the hot oil system is to the reboiler at the partial condenser unit. In this case, hot oil from the furnace is pumped through a tubed heat exchanger which is the reboiler. In both cases, hot oil does not make contact with the product. The heat from the hot oil system is released to the product through the wall of the vessel or through the tubing surface of the reboiler.

Wastes generated from the resin manufacturing process include samples taken during and after the reaction process, wastewater extracted from the process during reflux, solvents used for flushing process vessels between batches, waste resin generated during filtration and material transfer steps. These waste streams are all from the product in the reactor system vessel which has not been combined with, or made contact with, the heat transfer oil. In terms of the generator's knowledge of the process generating these wastes, PCB compounds are not part of the process generating these wastes since PCBs have never been ingredients used in the reactors to make resin polymers.

Historical Waste Analysis

Records pertinent to RCRA waste analysis were searched from 1980 to the present. In the years from 1980 to 1984, waste analysis information which was required for profile approval to dispose of wastes at commercial TSD facilities relied heavily on knowledge of the process generating the waste. Since PCBs were not used in the process materials, no analytical work was done pertaining to these compounds.

A revision to the facility Waste Analysis Plan in 1984 initiated more laboratory analysis, but PCBs were not specified in the Waste Analysis Plan and were not tested in the waste samples. The lab analysis report in Attachment 2 is typical of the lab analysis done at the time.

In 1986, a more comprehensive waste analysis program was started with analytical work performed by NUS Corporation. Lab results from this phase show that PCBs were not specifically analyzed, but a test for organic chlorine was performed on many of the waste samples. Inquiries made to the NUS laboratory indicate that the presence of a PCB compound in the sample should give a positive result on this test. In examination of these lab analysis reports, which are included as Attachment 3, the majority of reports show below the detection or quantification limit for organic chlorine. In the few reports which do show measurable organic chlorine, a correlation can be made to the presence of methylene chloride.

Analysis for PCB compounds was done in the waste analysis program by NUS in 1987. This data is included as Attachment 4. All of these reports show PCBs at less than detection except for one analytical report for a waste stream identified as Cationic Waste Resin which shows 39 mg/kg of PCB-1242. This isolated result is not in accord with the PCB compound Aroclor-1248 formerly used for heat transfer fluid at the facility. The result may be due to laboratory error, or due to the ubiquitous nature of PCBs in the environment.

Current Waste Analyses

Since 1987, waste analytical data from receipt samples at the Energy Recovery Unit has fulfilled most of the waste analysis requirements for the Circleville plant. Analysis for PCBs is a routine part of this testing. RCRA waste streams from the Circleville manufacturing plant have not shown presence of PCBs. Attachment 5 includes annual summaries from receipt samples of all current waste streams which are comparable to those that were previously stored in the units to be closed.

The RCRA wastes previously stored at the Waste Drum Storage Areas and the comparable currently generated waste streams can be summarized as follows:

- Waste Resin, D001, (alkyd, acrylic, polyester or epoxy polymers dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methyl isobutyl ketone, methanol, toluene, or methyl ethyl ketone). The following current waste streams documented in Attachment 5 are comparable: CRXADRC101, CRXADRC102, CRXADRC104, CRXDRSF111, CRXODRF101, CRXODRF102.

- Spent stripper containing methylene chloride (F002). This waste is comparable to current waste stream identified as CRXCCLF101 in Attachment 5.

- Incinerator brick and residue generated by the incineration of F003 and F005 wastes. Analysis performed on samples of this material in 1988 for the purpose of evaluating this waste regarding Land Disposal Restrictions did not include analysis for PCBs. The analysis that was performed is included as Attachment 6. Waste streams that were input to this incinerator did not contain PCBs. Current wastes, documented in Attachment 5, that are the same as those that were incinerated in this unit are: CRXSSLF101, CRXOCWF101, CRXODRF101, CRXODRF102.

- Waste acrylonitrile (U009). This waste stream is no longer generated in this form. Acrylonitrile is a raw material that has been used in a limited number of resin formulas and is still used for one product manufactured at the PPG Circleville facility.

- Waste toluene diisocyanate (U223). This waste is the same as current waste stream identified as CRXRMSP107 in Attachment 5.

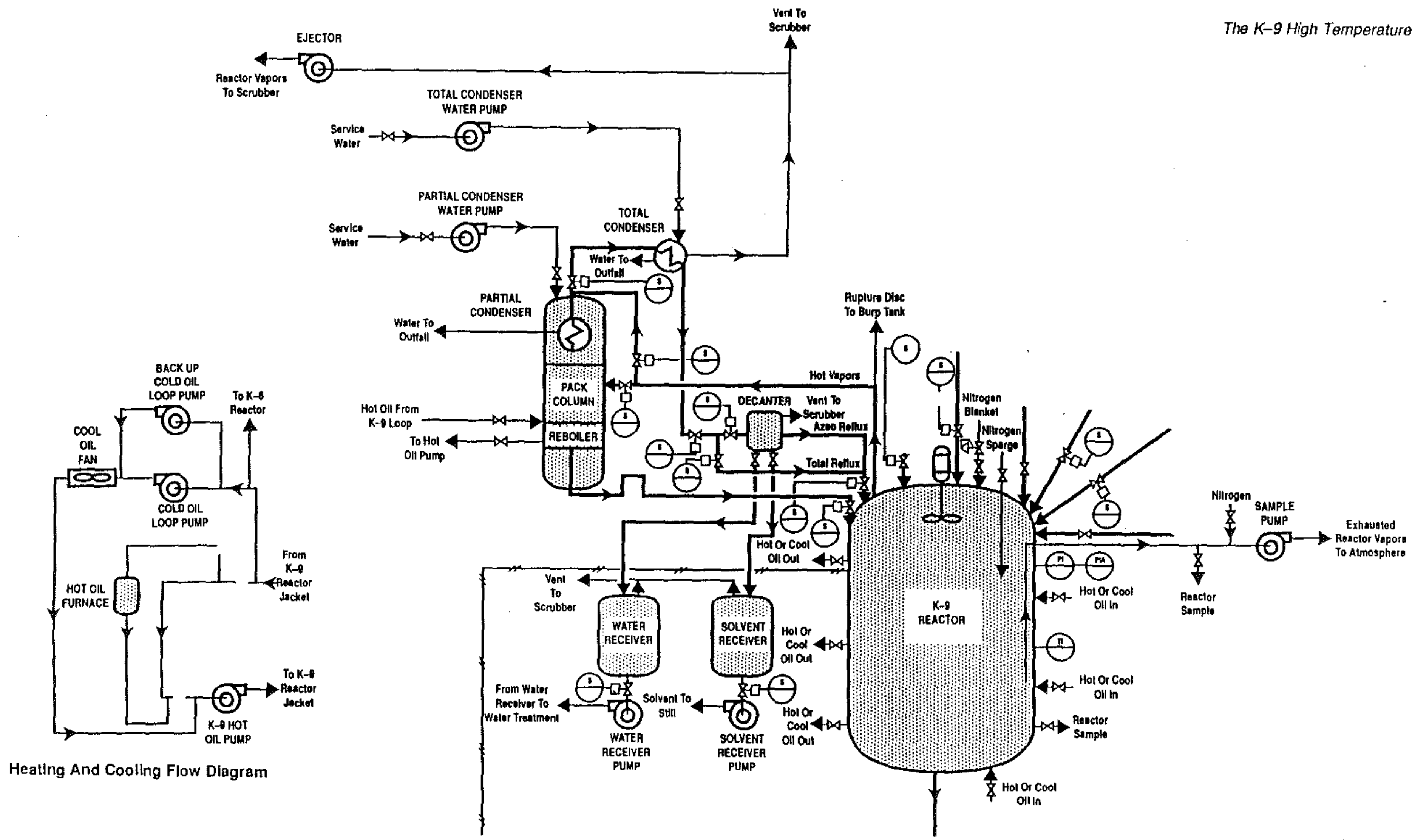
In summary, changes in resin formulation over the years have resulted in some variance in the amount of solvent constituents or the structure of resin polymers in the process wastes generated. However, these were not significant changes and the waste streams characterized in Attachment 5 are consistent with the wastes which were stored in the areas to be closed.

Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Lawrence Getz ______ Date 4/13/92

ATTACHMENT 1



Heating And Cooling Flow Diagram

Reacting Flows And Controls

ATTACHMENT 2

NUS CORPORATION

Laboratory Services Division
5350 Campbells Run Road
Pittsburgh, PA 15205

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275
412-788-1080

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: P.O.BOX 457
CIRCLEVILLE, OH 43113

NUS PROJECT NO: 7028P0
NUS CLIENT NO: 320228
NUS SAMPLE NO: 14030757

REPORT DATE: 04/16/84

ATTENTION: DAVE WEIBEL

DATE RECEIVED: 03/19/84

SAMPLE IDENTIFICATION: OFF-SPEE RESIN COMPOSITE 03/12

TEST	DETERMINATION	RESULTS	UNITS
S015	% Ash @ 550 C	0.1	%
S040	British Thermal Units	15000	BTU/lb
S070	Flash Point (Pensky-Marten)	85	F
S165	% Solids, total at 103 C	38.1	%
S168	Specific Weight	7.9	lb/gal
S210	Viscosity	55	CP
S450	Lead (Pb)	25	mg/l
S950	Acid Digestion		

Reviewed and Approved by: JMC

ATTACHMENT 3

NUS CORPORATION

Laboratory Services Division
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

Still Sludge

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
REPORT DATE: 01/11/87
ATTENTION: MR. DAVE MAZZOCCO

NUS CLIENT NO: 321909
NUS SAMPLE NO: 16110424
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 11/07/86

SAMPLE IDENTIFICATION: CV-86-0086-03

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.2	mg/l
M140	Chromium (Cr)	< 1	mg/l
M200	Lead (Pb)	8	mg/l
M250	Mercury (Hg)	0.0090	mg/l
OF01	Xylenes	240000	mg/l
OF05	2-butanone	< 40000	mg/l
OF08	4-methyl-2-pentanone	43000	mg/l
OF99	Volatile Organic Scan		
OM20	Ethyl Acetate	< 0.1	%
OM28	Methanol	< 0.1	%
OM48	Maleic Anhydride	< 1.0	%
OM57	n-Butanol	< 0.1	%
OM58	i-Butanol	< 0.1	%
OM64	Methyl Amyl Ketone	< 0.1	%
OV06	Carbon Tetrachloride	< 20000	mg/l
OV19	Ethylbenzene	72000	mg/l
OV22	Methylene Chloride	< 20000	mg/l
OV25	Toluene	29000	mg/l
OV30	Trichlorofluoromethane	< 20000	mg/l
S015	% Ash @ 550 C	< 1	%
S040	British Thermal Units	17000	BTU/lb
S064	Chlorine, Organic	< 0.1	%
S098	Fluorine, Organic	< 0.01	%
S195	% Water (Karl Fisher)	0.07	%
S950	Acid Digestion		
S971	Ashing		
S980	Oxygen Bomb Preparation		
W032	Ammonia as N (distillation)	44	mg/l
W435	Nitrogen, Kjeldahl (N)	180	mg/l
W440	Nitrogen, Organic (N)	140	mg/l
W620	Solids, total at 103 C	138000 13.8%	mg/l
W765	Total Sulfur-Gravimetric(S)	33	mg/l

COMMENTS:

TEntatively Identified Compound	Estimated Result	
Acetic Acid, Butyl Ester	35,000	mg/l

1-13-87
JAd

Reviewed and Approved by: JMC

JAN 16 1987
ENVIRONMENTAL ENGINEERING & CONTROL DEPARTMENT

NUS CORPORATION

Laboratory Services Division
5350 Campbells Run Road
Pittsburgh, PA 15205

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

412-788-1080

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
REPORT DATE: 07/23/86
ATTENTION: MS. CHRIS BABKA

NUS CLIENT NO: 321909
NUS SAMPLE NO: 16051372
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 05/28/86

SAMPLE IDENTIFICATION: CV-86-0043-03 - Solvent Recovery Still Sludge

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.02	mg/l
M200	Lead (Pb)	1.9	mg/l
M250	Mercury (Hg)	< 0.02	mg/l
OM03	Carbon Tetrachloride	< 3.0	%
OM04	Toluene	< 0.1	%
OM05	Xylenes	< 0.1	%
OM06	Heptanes	2.5	%
OM10	Ethylbenzene	< 0.4	%
OM23	Methyl Ethyl Ketone	< 0.5	%
OM24	Methyl Isobutyl Ketone	11	%
OM32	Butyl Cellosolve	3.9	%
OM44	Methylene Chloride	< 0.1	%
OM48	Maleic Anhydride	< 0.1	%
OM57	n-Butanol	1.3	%
OM64	Methyl Amyl Ketone	< 0.1	%
OM65	Petroleum Ether	< 0.1	%
OM71	Trichlorofluoromethane	< 0.4	%
S015	% Ash @ 550 C	< 0.1	%
S040	British Thermal Units	19000	BTU/lb
S064	Chlorine, Organic	< 0.1	%
S098	Fluorine, Organic	< 0.01	%
S195	% Water (Karl Fisher)	2.4	%
S950	Acid Digestion		
S971	Ashing		
S980	Oxygen Bomb Preparation		
W032	Ammonia as N (distillation)	53	mg/l
W435	Nitrogen, Kjeldahl (N)	330	mg/l
W440	Nitrogen, Organic (N)	270	mg/l
W620	Solids, total at 103 C	168000 (16.8%)	mg/l

RECEIVED
JUL 25 1986
ENVIRONMENTAL ENGINEERING
& CONTROL DEPARTMENT

COMMENTS:

Reviewed and Approved by: JMC

NUS CORPORATION

14/

Laboratory Services Division
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
ATTENTION: MR. DAVE MAZZOCCO

NUS CLIENT NO: 321909
NUS SAMPLE NO: 16110421
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 11/07/86

REPORT DATE: 01/11/87

MR+RD WASTE S/7

SAMPLE IDENTIFICATION: CV-86-0083-03

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.2	mg/l
M140	Chromium (Cr)	< 1	mg/l
M200	Lead (Pb)	13	mg/l
M250	Mercury (Hg)	0.005	mg/l
OF01	Xylenes	8.5	%
OF05	2-butanone	< 8	%
OF08	4-methyl-2-pentanone	19	%
OF99	Volatile Organic Scan		
OM20	Ethyl Acetate	< 0.1	%
OM28	Methanol	< 0.1	%
OM48	Maleic Anhydride	< 1.0	%
OM57	n-Butanol	< 0.1	%
OM58	i-Butanol	0.4	%
OM64	Methyl Amyl Ketone	< 0.1	%
OV06	Carbon Tetrachloride	< 4	%
OV19	Ethylbenzene	2.6	%
OV22	Methylene Chloride	< 4	%
OV25	Toluene	1.5	%
OV30	Trichlorofluoromethane	< 4	%
S015	% Ash @ 550 C	< 1	%
S040	British Thermal Units	16000	BTU/lb
S064	Chlorine, Organic	< 0.1	%
S098	Fluorine, Organic	< 0.01	%
S195	% Water (Karl Fisher)	2.1	%
S950	Acid Digestion		
S971	Ashing		
S980	Oxygen Bomb Preparation		
W032	Ammonia as N (distillation)	44	mg/l
W435	Nitrogen, Kjeldahl (N)	190	mg/l
W440	Nitrogen, Organic (N)	96	mg/l
W620	Solids, total at 103 C	146000	mg/l
W765	Total Sulfur-Gravimetric(S)	< 1	mg/l

E. MINATE

POC ER

RECEIVED JAN 1987

COMMENTS: NO ADDITIONAL VOLATILE ORGANICS > 1% WERE DETECTED.

RECEIVED JAN 16 [redacted]
ENVIRONMENTAL ENGINEERING & CONTROL DEPARTMENT

Reviewed and Approved by: JMC

NUS CORPORATION

Laboratory Services Division
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238

NUS CLIENT NO: 321909
NUS SAMPLE NO: 16110423
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 11/07/86

REPORT DATE: 01/11/87

ATTENTION: MR. DAVE MAZZOCCO

SELECTRON

SAMPLE IDENTIFICATION: CV-86-0085-03

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.2	mg/l
M140	Chromium (Cr)	< 1	mg/l
M200	Lead (Pb)	< 3	mg/l
M250	Mercury (Hg)	< 0.004	mg/l
OF01	Xylenes	110	mg/l
OF05	2-butanone	1600	mg/l
OF08	4-methyl-2-pentanone	1200	mg/l
OF99	Volatile Organic Scan		
OM20	Ethyl Acetate	< 0.1	%
OM28	Methanol	0.1	%
OM48	Maleic Anhydride	< 1.0	%
OM57	n-Butanol	< 0.1	%
OM58	i-Butanol	0.34	%
OM64	Methyl Amyl Ketone	< 0.1	%
OV06	Carbon Tetrachloride	< 40	mg/l
OV19	Ethylbenzene	< 40	mg/l
OV22	Methylene Chloride	< 40	mg/l
OV25	Toluene	64	mg/l
OV30	Trichlorofluoromethane	< 40	mg/l
S015	% Ash @ 550 C	< 1	%
S040	British Thermal Units	WNC	
S064	Chlorine, Organic	< 0.1	%
S098	Fluorine, Organic	< 0.01	%
S195	% Water (Karl Fisher)	72	%
S950	Acid Digestion		
S971	Ashing		
S980	Oxygen Bomb Preparation		
W032	Ammonia as N (distillation)	1200	mg/l
W435	Nitrogen, Kjeldahl (N)	1400	mg/l
W440	Nitrogen, Organic (N)	100	mg/l
W620	Solids, total at 103 C	88300	mg/l
W765	Total Sulfur-Gravimetric(S)	< 1	mg/l

RECEIVED JAN 16 1987 ENVIRONMENTAL ENGINEERING & CONTROL DEPARTMENT

COMMENTS: NO VOLATILE ORGANICS > 1% WERE DETECTED. WNC INDICATES THE SAMPLE WILL NOT COMBUST.

Reviewed and Approved by: JMC

A Halliburton Company

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Division
5350 Campbells Run Road
Pittsburgh, PA 15205

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275
412-788-1080

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
ATTENTION: MS. CHRIS BABKA

REPORT DATE: 07/23/86

NUS CLIENT NO: 321909
NUS SAMPLE NO: 16051371
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 05/28/86

SAMPLE IDENTIFICATION: CV-86-0042-03 - Alkyd S/T Waste

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.02	mg/l
M200	Lead (Pb)	3.5	mg/l
M250	Mercury (Hg)	< 0.02	mg/l
OM03	Carbon Tetrachloride	< 0.3	%
OM04	Toluene	< 0.1	%
OM05	Xylenes	1.4	%
OM06	Heptanes	< 0.1	%
OM10	Ethylbenzene	< 0.4	%
OM23	Methyl Ethyl Ketone	< 0.1	%
OM24	Methyl Isobutyl Ketone	21	%
OM32	Butyl Cellosolve	15	%
OM44	Methylene Chloride	< 0.1	%
OM48	Maleic Anhydride	< 0.1	%
OM57	n-Butanol	0.1	%
OM64	Methyl Amyl Ketone	< 0.1	%
OM65	Petroleum Ether	< 0.1	%
OM71	Trichlorofluoromethane	< 0.4	%
S015	% Ash @ 550 C	< 0.1	%
S040	British Thermal Units	9000	BTU/lb
S064	Chlorine, Organic	< 0.1	%
S098	Fluorine, Organic	< 0.01	%
S195	% Water (Karl Fisher)	40.1 ?	%
S950	Acid Digestion		
S971	Ashing		
S980	Oxygen Bomb Preparation		
W032	Ammonia as N (distillation)	28	mg/l
W435	Nitrogen, Kjeldahl (N)	740	mg/l
W440	Nitrogen, Organic (N)	720	mg/l
W620	Solids, total at 103 C	133000	mg/l

COMMENTS:

RECEIVED
JUL 25 1986
ENVIRONMENTAL ENGINEERING
& CONTROL DEPARTMENT

Reviewed and Approved by: JMC

A Halliburton Company

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Division
5350 Campbells Run Road
Pittsburgh, PA 15205

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275
412-788-1080

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
REPORT DATE: 07/23/86
ATTENTION: MS. CHRIS BABKA

NUS CLIENT NO: 321909
NUS SAMPLE NO: 16051370
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 05/28/86

SAMPLE IDENTIFICATION: CV-86-0041-03 - Selectron Waste S/T

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.02	mg/l
M200	Lead (Pb)	3.1	mg/l
M250	Mercury (Hg)	0.03	mg/l
OM03	Carbon Tetrachloride	< 3.0	%
OM04	Toluene	< 0.1	%
OM05	Xylenes	< 0.3	%
OM06	Heptanes	2.3	%
OM10	Ethylbenzene	< 0.7	%
OM23	Methyl Ethyl Ketone	1.0	%
OM24	Methyl Isobutyl Ketone	6.7	%
OM32	Butyl Cellosolve	5.8	%
OM44	Methylene Chloride	0.10	%
OM48	Maleic Anhydride	< 0.1	%
OM57	n-Butanol	1.6	%
OM64	Methyl Amyl Ketone	< 0.1	%
OM65	Petroleum Ether	< 0.1	%
OM71	Trichlorofluoromethane	< 0.4	%
S015	% Ash @ 550 C	< 0.1	%
S040	British Thermal Units	15000	BTU/lb
S064	Chlorine, Organic	0.16	%
S098	Fluorine, Organic	< 0.01	%
S195	% Water (Karl Fisher)	1.8	%
S950	Acid Digestion		
S971	Ashing		
S980	Oxygen Bomb Preparation		
W032	Ammonia as N (distillation)	56	mg/l
W435	Nitrogen, Kjeldahl (N)	360	mg/l
W440	Nitrogen, Organic (N)	300	mg/l
W620	Solids, total at 103 C	277000	mg/l

RECEIVED
JUL 25 1986
ENVIRONMENTAL ENGINEERING
& CONTROL DEPARTMENT

COMMENTS:

Reviewed and Approved by: JMC

A Halliburton Company

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Division
5350 Campbells Run Road
Pittsburgh, PA 15205

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

412-788-1080

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
REPORT DATE: 07/23/86
ATTENTION: MS. CHRIS BABKA

NUS CLIENT NO: 321909
NUS SAMPLE NO: 16051369
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 05/28/86

SAMPLE IDENTIFICATION: CV-86-0040-03 - MR & RD Waste Storage Samples

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.02	mg/l
M200	Lead (Pb)	2.2	mg/l
M250	Mercury (Hg)	0.05	mg/l
OM03	Carbon Tetrachloride	< 3.0	%
OM04	Toluene	< 0.1	%
OM05	Xylenes	< 0.1	%
OM06	Heptanes	2.8	%
OM10	Ethylbenzene	< 0.1	%
OM23	Methyl Ethyl Ketone	1.3	%
OM24	Methyl Isobutyl Ketone	3.4	%
OM32	Butyl Cellosolve	1.8	%
OM44	Methylene Chloride	0.19	%
OM48	Maleic Anhydride	< 0.1	%
OM57	n-Butanol	1.0	%
OM64	Methyl Amyl Ketone	< 0.1	%
OM65	Petroleum Ether	< 0.1	%
OM71	Trichlorofluoromethane	< 0.4	%
S015	% Ash @ 550 C	< 0.1	%
S040	British Thermal Units	15000	BTU/lb
S064	Chlorine, Organic	0.46	%
S195	% Water (Karl Fisher)	3.61	%
S950	Acid Digestion		
S971	Ashing		
S980	Oxygen Bomb Preparation		
W032	Ammonia as N (distillation)	45	mg/l
W435	Nitrogen, Kjeldahl (N)	360	mg/l
W440	Nitrogen, Organic (N)	320	mg/l
W620	Solids, total at 103 C	393000	mg/l

RECEIVED
JUL 25 1986
ENVIRONMENTAL ENGINEERING & CONTROL DEPARTMENT

COMMENTS:

Reviewed and Approved by: JMC

A Halliburton Company

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Division
5350 Campbells Run Road
Pittsburgh, PA 15205

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275
412-788-1080

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
REPORT DATE: 07/23/86
ATTENTION: MS. CHRIS BABKA

NUS CLIENT NO: 321909
NUS SAMPLE NO: 16051374
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 05/28/86

SAMPLE IDENTIFICATION: CV-86-0048-03 - WPS-18384 (ACRYLIC RESIN, HEPTANE SOLVENT)

TEST	DETERMINATION	RESULTS	UNITS
S015	% Ash @ 550 C	< 0.1	%
S064	Chlorine, Organic	< 0.1	%
S980	Oxygen Bomb Preparation		

RECEIVED
JUL 25 1986
ENVIRONMENTAL ENGINEERING
& CONTROL DEPARTMENT

COMMENTS:

Reviewed and Approved by: JMC

NUS CORPORATION

Laboratory Services Division
5350 Campbells Run Road
Pittsburgh, PA 15205

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275
412-788-1080

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
ATTENTION: MS. CHRIS BABKA

REPORT DATE: 07/23/86

NUS CLIENT NO: 321909
NUS SAMPLE NO: 16051372
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 05/28/86

SAMPLE IDENTIFICATION: CV-86-0043-03 - Solvent Recovery Still Sludge

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.02	mg/l
M200	Lead (Pb)	1.9	mg/l
M250	Mercury (Hg)	< 0.02	mg/l
OM03	Carbon Tetrachloride	< 3.0	%
OM04	Toluene	< 0.1	%
OM05	Xylenes	< 0.1	%
OM06	Heptanes	2.5	%
OM10	Ethylbenzene	< 0.4	%
OM23	Methyl Ethyl Ketone	< 0.5	%
OM24	Methyl Isobutyl Ketone	11	%
OM32	Butyl Cellosolve	3.9	%
OM44	Methylene Chloride	< 0.1	%
OM48	Maleic Anhydride	< 0.1	%
OM57	n-Butanol	1.3	%
OM64	Methyl Amyl Ketone	< 0.1	%
OM65	Petroleum Ether	< 0.1	%
OM71	Trichlorofluoromethane	< 0.4	%
S015	% Ash @ 550 C	< 0.1	%
S040	British Thermal Units	19000	BTU/lb
S064	Chlorine, Organic	< 0.1	%
S098	Fluorine, Organic	< 0.01	%
S195	% Water (Karl Fisher)	2.4	%
S950	Acid Digestion		
S971	Ashing		
S980	Oxygen Bomb Preparation		
W032	Ammonia as N (distillation)	53	mg/l
W435	Nitrogen, Kjeldahl (N)	330	mg/l
W440	Nitrogen, Organic (N)	270	mg/l
W620	Solids, total at 103 C	168000	mg/l

RECEIVED
JUL 25 1986
ENVIRONMENTAL ENGINEERING
& CONTROL DEPARTMENT

COMMENTS:

Reviewed and Approved by: JMC

A Halliburton Company

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Division
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
REPORT DATE: 07/23/86
ATTENTION: MS. CHRIS BABKA

NUS CLIENT NO: 321909
NUS SAMPLE NO: 16051375
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 05/26/86

SAMPLE IDENTIFICATION: CV-86-0049-03 - 75-10 Floor Stripper - Used

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.02	mg/l
M200	Lead (Pb)	3.3	mg/l
M250	Mercury (Hg)	0.11	mg/l
OF01	Xylenes	2.7	%
OF05	2-butanone	< 0.8	%
OF08	4-methyl-2-pentanone	3.3	%
OM29	Ethanol	3.5	%
OM32	Butyl Cellosolve	0.86	%
OV19	Ethylbenzene	0.7	%
OV22	Methylene Chloride	15	%
OV25	Toluene	0.7	%
OV91	Volatile Organic Scan		
S015	% Ash @ 550 C	1.0	%
S040	British Thermal Units	8200	BTU/lb
S064	Chlorine, Organic	10	%
S195	% Water (Karl Fisher)	23.2	%
S950	Acid Digestion		
S971	Ashing		
S980	Oxygen Bomb Preparation		
W620	Solids, total at 103 C	205000	mg/l

RECEIVED
JUL 25 1986
ENVIRONMENTAL ENGINEERING
& CONTROL DEPARTMENT

COMMENTS: NO ADDITIONAL VOLATILE ORGANICS > 1% WERE DETECTED.

Reviewed and Approved by: JMC

A Halliburton Company

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Division
5350 Campbells Run Road
Pittsburgh, PA 15205

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

412-788-1080

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238

REPORT DATE: 01/11/87

ATTENTION: MR. DAVE MAZZOCCO

NUS CLIENT NO: 321909
NUS SAMPLE NO: 16110422
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 11/07/86

ALKYD WASTE S/T

SAMPLE IDENTIFICATION: CV-86-0084-03

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.2	mg/l
M140	Chromium (Cr)	< 1	mg/l
M200	Lead (Pb)	< 3	mg/l
M250	Mercury (Hg)	0.032	mg/l
OF01	Xylenes	94000	mg/l
OF05	2-butanone	< 40000	mg/l
OF08	4-methyl-2-pentanone	170000	mg/l
OF99	Volatile Organic Scan		
OM20	Ethyl Acetate	< 0.1	%
OM28	Methanol	0.1	%
OM48	Maleic Anhydride	< 1.0	%
OM57	n-Butanol	< 0.1	%
OM58	i-Butanol	< 0.1	%
OM64	Methyl Amyl Ketone	< 0.1	%
OV06	Carbon Tetrachloride	< 20000	mg/l
OV19	Ethylbenzene	30000	mg/l
OV22	Methylene Chloride	< 20000	mg/l
OV25	Toluene	23000	mg/l
OV30	Trichlorofluoromethane	< 20000	mg/l
S015	% Ash @ 550 C	< 1	%
S040	British Thermal Units	16000	BTU/lb
S064	Chlorine, Organic	0.3	%
S098	Fluorine, Organic	0.03	%
S195	% Water (Karl Fisher)	1.9	%
S950	Acid Digestion		
S971	Ashing		
S980	Oxygen Bomb Preparation		
W032	Ammonia as N (distillation)	93	mg/l
W435	Nitrogen, Kjeldahl (N)	310	mg/l
W440	Nitrogen, Organic (N)	220	mg/l
W620	Solids, total at 103 C	112000	mg/l
W765	Total Sulfur-Gravimetric(S)	2.7	mg/l

COMMENTS: NO ADDITIONAL VOLATILE ORGANICS > 1% WERE DETECTED.

Reviewed and Approved by: JMC

JAN 16 1987
ENVIRONMENTAL ENGINEERING & CONTROL DEPARTMENT

NUS CORPORATION

Laboratory Services Group
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

SPENT FLOOR STRIPPER, COMBINATION OF
SAMPLES FROM 5 DRUMS SELECTED AT RANDOM.
LOWER PHASE

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
REPORT DATE: 07/13/87
ATTENTION: MR. DAVE MAZZOCCO

NUS CLIENT NO: 321909
NUS SAMPLE NO: 17051366
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 05/27/87

SAMPLE IDENTIFICATION: CV-87-0189-03 LOWER PHASE 05/11

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.05	mg/l
M200	Lead (Pb)	1.6	mg/l
M250	Mercury (Hg)	0.050	mg/l
OF01	Xylenes	< 20000	mg/l
OF05	2-Butanone(MEK)	67000	mg/l
OF08	4-Methyl-2-Pentanone(MIBK)	< 40000	mg/l
OF09	Styrene	< 20000	mg/l
OF99	Volatile Organic Scan		
OM07	2-Butoxy ethanol	1.3	%
OM12	Kerosene	< 0.1	%
OM29	Ethanol	1.6	%
OM32	Butyl Cellosolve	1.1	%
OM36	Mineral spirits	< 0.1	%
OM51	Ethylene Glycol	< 0.1	%
OM61	Butyl Acetate	0.35	%
OM64	Methyl Amyl Ketone	< 0.1	%
OO22	Naptha	< 0.2	%
OO23	Heptane	< 0.1	%
OV22	Methylene Chloride	450000	mg/l
OV25	Toluene	< 20000	mg/l
OV27	1,1,1-Trichloroethane	< 20000	mg/l
OV28	1,1,2-Trichloroethane	< 20000	mg/l
S015	% Ash at 550 C	0.1	%
S040	British Thermal Units	9610	BTU/lb
S064	Chlorine, Organic	30	%
S090	Flash Point (Pensky-Marten)	80	F
S098	Fluorine, Organic	< 0.01	%
S168	Specific Weight	9.2	lb/gal
S195	% Water (Karl Fisher)	2.2	%
S210	Viscosity	20	CP
S980	Oxygen Bomb Preparation		
W315	Halogens, Total Organic (TOX)	INT	

RECEIVED
JUL 14 1987
ENVIRONMENTAL ENGINE...

RECEIVED
JUL 1987

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Group
5350 Campbells Run Road
Pittsburgh, PA 15205

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275
412-788-1080

SPENT FLOOR STRIPPER, COMBINATION OF
SAMPLES FROM 5 DRUMS SELECTED AT RANDOM.
LOWER PHASE

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
ATTENTION: MR. DAVE MAZZOCCO

REPORT DATE: 07/13/87

NUS CLIENT NO: 321909
NUS SAMPLE NO: 17051366
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 05/27/87

SAMPLE IDENTIFICATION: CV-87-0189-03 LOWER PHASE 05/11

TEST	DETERMINATION	RESULTS	UNITS
W620	Solids, Total at 103 C	210000	mg/l
	Toluene	9800	mg/l
	Ethylbenzene	< 20000	mg/l

CAK 7/13/87

JUL 1987 RECEIVED

RECEIVED JUL 14 1987 ENVIRON...

COMMENTS: Sample contained gasoline at concentration of 8.9%. INT for TOX; Sample is not soluble in water.

Reviewed and Approved by: JMC

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Group
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

SPENT FLOOR STRIPPER, COMBINATION OF SAMPLES FROM 5 DRUMS SELECTED AT RANDOM. UPPER PHASE

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
ATTENTION: MR. DAVE MAZZOCCO

REPORT DATE: 07/13/87

NUS CLIENT NO: 321909
NUS SAMPLE NO: 17051365
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 05/27/87

SAMPLE IDENTIFICATION: CV-87-0189-03 UPPER PHASE 05/11

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.05	mg/l
M200	Lead (Pb)	1.3	mg/l
M250	Mercury (Hg)	< 0.004	mg/l
OF01	Xylenes	< 400	mg/l
OF05	2-Butanone(MEK)	8200	mg/l
OF08	4-Methyl-2-Pentanone(MIBK)	< 800	mg/l
OF09	Styrene	< 400	mg/l
OF99	Volatile Organic Scan		
OM07	2-Butoxy ethanol	0.21	%
OM12	Kerosene	< 0.1	%
OM29	Ethanol	3.6	%
OM32	Butyl Cellosolve	0.13	%
OM36	Mineral spirits	< 0.1	%
OM51	Ethylene Glycol	< 0.1	%
OM61	Butyl Acetate	< 0.1	%
OM64	Methyl Amyl Ketone	< 0.1	%
OO22	Naptha	< 0.2	%
OO23	Heptane	< 0.1	%
OV22	Methylene Chloride	9000	mg/l
OV25	Toluene	< 400	mg/l
OV27	1,1,1-Trichloroethane	< 400	mg/l
OV28	1,1,2-Trichloroethane	< 400	mg/l
S015	% Ash at 550 C	1.4	%
S040	British Thermal Units	1800	BTU/lb
S064	Chlorine, Organic	0.10	%
S090	Flash Point (Pensky-Marten)	< /= 70	F
S098	Fluorine, Organic	< 0.01	%
S168	Specific Weight	8.4	lb/gal
S195	% Water (Karl Fisher)	62	%
S210	Viscosity	12	CP
S980	Oxygen Bomb Preparation		
W315	Halogens, Total Organic (TOX)	17000	ug/l

RECEIVED
JUL 14 1987
ENVIRONMENTAL ENGINEERING

RECEIVED
JUL 1987

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Group
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

SPENT FLOOR STRIPPER, COMBINATION OF
SAMPLES FROM 5 DRUMS SELECTED AT RANDOM.
UPPER PHASE

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
ATTENTION: MR. DAVE MAZZOCCO

REPORT DATE: 07/13/87

NUS CLIENT NO: 321909
NUS SAMPLE NO: 17051365
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 05/27/87

SAMPLE IDENTIFICATION: CV-87-0189-03 UPPER PHASE 05/11

TEST	DETERMINATION	RESULTS	UNITS
W620	Solids, Total at 103 C	28100	mg/l
	Acetone	1200	mg/l
	Ethylbenzene	< 400	mg/l
	Toluene	140	mg/l

CAK
7/13/87

JUL 1987
RECEIVED
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

COMMENTS:

RECEIVED
JUL 14 1987

Reviewed and Approved by: JMC

CLIENT ORIGINAL

ATTACHMENT 4

NUS CORPORATION

Laboratory Services Group
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

CATIONIC WASTE RESIN

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
REPORT DATE: 08/20/87
ATTENTION: MR. DAVE NAZZOCCO

NUS CLIENT NO: 321909
NUS SAMPLE NO: 17072328
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 07/30/87

SAMPLE IDENTIFICATION: CV-87-0207-03 07/21

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.05	mg/l
M140	Chromium (Cr)	< 0.1	mg/l
M200	Lead (Pb)	< 0.3	mg/l
M250	Mercury (Hg)	< 0.004	mg/l
M270	Nickel (Ni)	< 0.3	mg/l
M330	Thallium (Tl)	< 1	mg/l
OF01	Xylenes	1100	mg/l
OF05	2-Butanone(MEK)	6300	mg/l
OF08	4-Methyl-2-Pentanone(MIBK)	3900	mg/l
OF99	Volatile Organic Scan		
OM20	Ethyl Acetate	< 1.0	ug/l
OM28	Methanol	0.16	%
OM48	Maleic Anhydride	< 0.5	%
OM57	n-Butanol	1.2	%
OM58	i-Butanol	< 0.2	%
OM64	Methyl Amyl Ketone	< 0.1	%
OP80	Total PCBs	39	mg/kg 1242 ←
OV19	Ethylbenzene	220	mg/l
OV22	Methylene Chloride	6400	mg/l
OV25	Toluene	< 200	mg/l
S015	% Ash at 550 C	0.1	%
S040	British Thermal Units	WNC	
S064	Chlorine, Organic	0.08	%
S098	Fluorine, Organic	< 0.01	%
S195	% Water (Karl Fisher)	60	%
S980	Oxygen Bomb Preparation		
W032	Ammonia - Distillation (as N)	6.5	mg/l
W435	Nitrogen, Kjeldahl (N)	240	mg/l
W440	Nitrogen, Organic (N)	230	mg/l
W765	Total Sulfur (S)-gravimetric	INT	

COMMENTS: NO ADDITIONAL VOLATILE COMPOUNDS WERE IDENTIFIED.

RECEIVED
AUG 20 1987

Reviewed and Approved by: JCS

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Group
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

SPEC-CATIONIC CLEANUP

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
REPORT DATE: 08/20/87
ATTENTION: MR. DAVE MAZZOCCO

NUS CLIENT NO: 321909
NUS SAMPLE NO: 17072327
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 07/30/87

SAMPLE IDENTIFICATION: CV-87-0206-03 07/21

TEST	DETERMINATION	RESULTS	UNITS
M270	RCRA METALS		
M030	Arsenic (As)	< 0.01	mg/l
M040	Barium (Ba)	< 1	mg/l
M090	Cadmium (Cd)	< 0.05	mg/l
M140	Chromium (Cr)	< 0.1	mg/l
M200	Lead (Pb)	< 0.3	mg/l
M250	Mercury (Hg)	0.01	mg/l
M290	Selenium (Se)	< 0.04	mg/l
M300	Silver (Ag)	< 0.1	mg/l
M270	Nickel (Ni)	< 0.3	mg/l
M330	Thallium (Tl)	< 1	mg/l
OF01	Xylenes	180000	mg/l
OF05	2-Butanone(MEK)	< 4000	mg/l
OF08	4-Methyl-2-Pentanone(MIBK)	130000	mg/l
OM32	Butyl Cellosolve	50	%
OM64	Methyl Amyl Ketone	< 2.0	%
OP80	Total PCBs	< 10	mg/kg
OV06	Carbon Tetrachloride	< 2000	mg/l
OV19	Ethylbenzene	35000	mg/l
OV22	Methylene Chloride	< 2000	mg/l
OV25	Toluene	< 2000	mg/l
OV30	Trichlorofluoromethane	< 2000	mg/l
OV91	Volatile Organic Analysis		
S015	% Ash at 550 C	< 0.1	%
S040	British Thermal Units	12200	BTU/lb
S064	Chlorine, Organic	< 0.01	%
S098	Fluorine, Organic	< 0.01	%
S195	% Water (Karl Fisher)	0.4	%
S980	Oxygen Bomb Preparation		
W032	Ammonia - Distillation (as N)	1.4	mg/l
W435	Nitrogen, Kjeldahl (N)	370	mg/l
W440	Nitrogen, Organic (N)	370	mg/l

RECEIVED
AUG 20 1987

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Group
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

CATIONIC FLUSHWATER

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
REPORT DATE: 06/04/87
ATTENTION: MR. DAVE MAZZOCCO

NUS CLIENT NO: 321909
NUS SAMPLE NO: 17041489
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 04/24/87

SAMPLE IDENTIFICATION: CV-87-0172-03

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.05	mg/l
M140	Chromium (Cr)	< 0.1	mg/l
M200	Lead (Pb)	2.6	mg/l
M250	Mercury (Hg)	< 0.004	mg/l
OF01	Xylenes	66	mg/l
OF08	4-Methyl-2-Pentanone(MIBK)	1200	mg/l
OF99	Volatile Organic Scan		
OM32	Butyl Cellosolve	< 0.1	%
OM57	n-Butanol	< 0.1	%
OM58	i-Butanol	< 0.1	%
OM59	t-Butanol	< 0.1	%
OP80	Total PCBs	< 10	mg/kg
OV06	Carbon Tetrachloride	< 67	mg/l
OV22	Methylene Chloride	1700	mg/l
OV25	Toluene	< 67	mg/l
OV30	Trichlorofluoromethane	< 67	mg/l
S015	% Ash at 550 C	< 0.1	%
S040	British Thermal Units	WNC	
S064	Chlorine, Organic	< 0.1	%
S090	Flash Point (Pensky-Marten)	> 140	F
S098	Fluorine, Organic	< 0.01	%
S195	% Water (Karl Fisher)	56	%
S950	Acid Digestion		
S971	Ashing		
S980	Oxygen Bomb Preparation		
W032	Ammonia - Distillation (as N)	< 10	mg/l
W050	BOD, 5-day (O2)	12000	mg/l
W116	Organic Carbon(non-purgeable)	13500	mg/l
W435	Nitrogen, Kjeldahl (N)	100	mg/l
W440	Nitrogen, Organic (N)	100	mg/l
W590	Solids, Dissolved at 180 C	5280	mg/l
W610	Solids, Suspended at 103 C	380	mg/l

RECEIVED JUN 10 1987

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Group
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

COMPOSITE OF DIRTY SOLVENT-SOUTH TANK (UPPER LAYER)

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
REPORT DATE: 06/18/87
ATTENTION: MR. DAVE MAZZOCCO

NUS CLIENT NO: 321909
NUS SAMPLE NO: 17041616
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 04/28/87

SAMPLE IDENTIFICATION: CV-87-0182-03 UPPER LAYER 04/24

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.05	mg/l
M140	Chromium (Cr)	0.1	mg/l
M200	Lead (Pb)	< 0.3	mg/l
M250	Mercury (Hg)	0.04	mg/l
0F01	Xylenes	360000	mg/l (36%)
0F05	2-Butanone(MEK)	< 16000	mg/l
0F08	4-Methyl-2-Pentanone(MIBK)	120000	mg/l (12%)
0F99	Volatile Organic Scan		
0M32	Butyl Cellosolve	3.8	%
0M50	Petroleum naphtha	< 1.0	%
0M57	n-Butanol	1.5	%
0M58	i-Butanol	0.4	%
0M59	t-Butanol	< 0.1	%
0M64	Methyl Amyl Ketone	< 1	%
0P80	Total PCBs	< 10	mg/kg
0V06	Carbon Tetrachloride	< 8000	mg/l
0V22	Methylene Chloride	< 8000	mg/l
0V25	Toluene	88000	mg/l (8.8%)
0V30	Trichlorofluoromethane	< 8000	mg/l
S015	% Ash at 550 C	< 0.1	%
S040	British Thermal Units	16900	BTU/lb
S064	Chlorine, Organic	< 0.1	%
S090	Flash Point (Pensky-Marten)	< /= 70	F
S098	Fluorine, Organic	0.02	%
S168	Specific Weight	6.9	lb/gal
S195	% Water (Karl Fisher)	0.2	%
S210	Viscosity	5	CP
S950	Acid Digestion		
S971	Ashing		
S980	Oxygen Bomb Preparation		
W032	Ammonia - Distillation (as N)	8	mg/l
W435	Nitrogen, Kjeldahl (N)	22	mg/l

JUN 19 1987

JUL 1987
RECEIVED

PAGE NO: 1

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Group
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

COMPOSITE OF DIRTY SOLVENT-NORTH TANK (UPPER LAYER)

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
REPORT DATE: 06/18/87
ATTENTION: MR. DAVE MAZZOCCO

NUS CLIENT NO: 321909
NUS SAMPLE NO: 17041618
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 04/28/87

SAMPLE IDENTIFICATION: CV-87-0183-03 UPPER LAYER 04/24

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.05	mg/l
M140	Chromium (Cr)	< 0.1	mg/l
M200	Lead (Pb)	< 0.3	mg/l
M250	Mercury (Hg)	0.008	mg/l
OF01	Xylenes	260000	mg/l 26%
OF05	2-Butanone(MEK)	< 8000	mg/l
OF08	4-Methyl-2-Pentanone(MIBK)	130000	mg/l 13%
OF99	Volatile Organic Scan		
OM32	Butyl Cellosolve	4.2	%
OM50	Petroleum naphtha	< 1.0	%
OM57	n-Butanol	1.5	%
OM58	i-Butanol	0.5	%
OM59	t-Butanol	< 0.1	%
OM64	Methyl Amyl Ketone	< 1.0	%
OP80	Total PCBs	< 10	mg/kg
OV06	Carbon Tetrachloride	< 4000	mg/l
OV22	Methylene Chloride	< 4000	mg/l
OV25	Toluene	69000	mg/l 6.9
OV30	Trichlorofluoromethane	< 4000	mg/l
S015	% Ash at 550 C	< 0.1	%
S040	British Thermal Units	17100	BTU/lb
S064	Chlorine, Organic	< 0.1	%
S090	Flash Point (Pensky-Marten)	</= 70	F
S098	Fluorine, Organic	< 0.01	%
S168	Specific Weight	7.0	lb/gal
S195	% Water (Karl Fisher)	0.6	%
S210	Viscosity	5	CP
S950	Acid Digestion		
S971	Ashing		
S980	Oxygen Bomb Preparation		
W032	Ammonia - Distillation (as N)	11	mg/l
W435	Nitrogen, Kjeldahl (N)	300	mg/l

JUL 1987 RECEIVED

RECEIVED JUN 19 1987 ENVIRONMENTAL ENGINEERING

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Group
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

FILTER CARTRIDGES NON-LITHARGE

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
ATTENTION: MR. DAVE MAZZOCCO

REPORT DATE: 06/04/87

NUS CLIENT NO: 321909
NUS SAMPLE NO: 17041492
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 04/24/87

SAMPLE IDENTIFICATION: CV-87-0175-03

TEST	DETERMINATION	RESULTS	UNITS
0143	TOTAL PCB'S IN SEDIMENT		
0E23	MLS Extraction		
0P81	Total PCBs - Soil	< 5	mg/kg
0F01	Xylenes	7100	mg/kg
0F05	2-Butanone(MEK)	< 200	mg/kg
0F08	4-Methyl-2-Pentanone(MIBK)	200	mg/kg
0F99	Volatile Organic Scan		
0M20	Ethyl Acetate	< 0.1	%
0M29	Ethanol	< 0.1	%
0M32	Butyl Cellosolve	1.2	%
0M64	Methyl Amyl Ketone	< 0.1	%
0N19	n-Propyl Acetate	< 0.1	%
0V06	Carbon Tetrachloride	< 100	mg/kg
0V22	Methylene Chloride	< 100	mg/kg
0V25	Toluene	620	mg/kg
0V30	Trichlorofluoromethane	< 100	mg/kg
S271	RCRA METALS - SOLID		
S400	Arsenic (As)	< 0.1	mg/kg
S410	Barium (Ba)	10	mg/kg
S420	Cadmium (Cd)	< 0.5	mg/kg
S430	Chromium (Cr)	1	mg/kg
S450	Lead (Pb)	14	mg/kg
S460	Mercury (Hg)	< 0.1	mg/kg
S490	Selenium (Se)	< 0.4	mg/kg
S500	Silver (Ag)	< 1	mg/kg
S950	Acid Digestion		
S010	Ammonia, Distillation (as N)	450	mg/kg
S015	% Ash at 550 C	2.9	%
S040	British Thermal Units	11900	BTU/lb
S064	Chlorine, Organic	< 0.1	%
S090	Flash Point (Pensky-Marten)	> 140	F
S098	Fluorine, Organic	< 0.01	%

RECEIVED
JUN 10 1987

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Group
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

CATIONIC DISTILLATE (MIBK)

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
REPORT DATE: 06/04/87
ATTENTION: MR. DAVE MAZZOCCO

NUS CLIENT NO: 321909
NUS SAMPLE NO: 17041490
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 04/24/87

SAMPLE IDENTIFICATION: CV-87-0173-03

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.05	mg/l
M140	Chromium (Cr)	< 0.1	mg/l
M200	Lead (Pb)	< 0.3	mg/l
M250	Mercury (Hg)	< 0.004	mg/l
OF01	Xylenes	< 16000	mg/l
OF08	4-Methyl-2-Pentanone(MIBK)	740000	mg/l 74%
OF99	Volatile Organic Scan		
OM10	Ethylbenzene	< 0.1	%
OM32	Butyl Cellosolve	< 0.1	%
OM57	n-Butanol	2.7	%
OM58	i-Butanol	< 0.1	%
OM59	t-Butanol	< 0.1	%
OP80	Total PCBs	< 10	mg/kg
OV06	Carbon Tetrachloride	< 16000	mg/l <1.6%
OV22	Methylene Chloride	< 16000	mg/l
OV25	Toluene	< 16000	mg/l
OV30	Trichlorofluoromethane	< 16000	mg/l
S015	% Ash at 550 C	< 0.1	%
S040	British Thermal Units	15550	BTU/lb
S064	Chlorine, Organic	< 0.1	%
S090	Flash Point (Pensky-Marten)	</= 70	F
S098	Fluorine, Organic	< 0.01	%
S195	% Water (Karl Fisher)	1.2	%
S950	Acid Digestion		
S971	Ashing		
S980	Oxygen Bomb Preparation		
W032	Ammonia - Distillation (as N)	< 10	mg/l
W050	BOD, 5-day (O2)	> 180000	mg/l
W116	Organic Carbon(non-purgeable)	INT	
W435	Nitrogen, Kjeldahl (N)	44	mg/l
W440	Nitrogen, Organic (N)	44	mg/l
W765	Total Sulfur (S)-gravimetric	400	mg/l

COMMENTS: NO ADDTIONAL VOLATILE ORGANICS WERE DETECTED. INT FOR TOC DUE TO SAMPLE MATRIX INTERFERENCE.

Reviewed and Approved by: JMC

JUN 10 '96

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Group
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

COMPOSITE OF SOLVENT STILL SLUDGE

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
REPORT DATE: 06/04/87
ATTENTION: MR. DAVE MAZZOCCO

NUS CLIENT NO: 321909
NUS SAMPLE NO: 17041493
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 04/24/87

SAMPLE IDENTIFICATION: CV-87-0180-03

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.05	mg/l
M140	Chromium (Cr)	< 0.1	mg/l
M200	Lead (Pb)	< 0.3	mg/l
M250	Mercury (Hg)	0.12	mg/l
OF01	Xylenes	330000	mg/l
OF05	2-Butanone(MEK)	< 16000	mg/l
OF08	4-Methyl-2-Pentanone(MIBK)	34000	mg/l
OF99	Volatile Organic Scan		
OM10	Ethylbenzene	9.6	%
OM32	Butyl Cellosolve	< 0.1	%
OM50	Petroleum naphtha	< 1	%
OM57	n-Butanol	< 0.1	%
OM58	i-Butanol	< 0.1	%
OM59	t-Butanol	< 0.1	%
OM64	Methyl Amyl Ketone	< 0.1	%
OP80	Total PCBs	< 10	mg/kg
OV06	Carbon Tetrachloride	< 8000	mg/l
OV22	Methylene Chloride	< 8000	mg/l
OV25	Toluene	35000	mg/l
OV30	Trichlorofluoromethane	< 8000	mg/l
S015	% Ash at 550 C	< 0.1	%
S040	British Thermal Units	16700	BTU/lb
S064	Chlorine, Organic	< 0.1	%
S090	Flash Point (Pensky-Marten)	< 70	F
S098	Fluorine, Organic	< 0.01	%
S168	Specific Weight	7.3	lb/gal
S195	% Water (Karl Fisher)	0.06	%
S210	Viscosity	10	CP
S950	Acid Digestion		
S971	Ashing		
S980	Oxygen Bomb Preparation		
W032	Ammonia - Distillation (as N)	39	mg/l

JUN 10 1987
ENVIRONMENTAL ENGINEERING

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Group
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

COMPOSITE OF SOLVENT STILL SLUDGE

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
ATTENTION: MR. DAVE MAZZOCCO

REPORT DATE: 06/04/87

NUS CLIENT NO: 321909
NUS SAMPLE NO: 17041493
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 04/24/87

SAMPLE IDENTIFICATION: CV-87-0180-03

TEST	DETERMINATION	RESULTS	UNITS
W435	Nitrogen, Kjeldahl (N)	540	mg/l
W440	Nitrogen, Organic (N)	500	mg/l
W620	Solids, Total at 103 C	97900 9.8%	mg/l
W765	Total Sulfur (S)-gravimetric	680	mg/l

TENTATIVELY IDENTIFIED COMPOUNDS	ESTIMATED RESULT (mg/L)
3-Methyl Hexane	5,300
Butyl Ester, Acetic Acid	21,000
Unknown Alkane	35,000

CAK
6/8/87

RECEIVED
JUN 10 1987
ENVIRONMENTAL ENGINEERING
& CONTROL DEPARTMENT

COMMENTS:

Reviewed and Approved by: JMC

CLIENT ORIGINAL

NUS CORPORATION

RECEIVED
JUN 10 1987
ENVIRONMENTAL ENGINEERING
& CONTROL DEPARTMENT

Laboratory Services Group
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

WASTE RESIN

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
ATTENTION: MR. DAVE MAZZOCCO

REPORT DATE: 06/04/87

NUS CLIENT NO: 321909
NUS SAMPLE NO: 17041494
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 04/24/87

SAMPLE IDENTIFICATION: CV-87-0181-03

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.05	mg/l
M140	Chromium (Cr)	< 0.1	mg/l
M200	Lead (Pb)	< 0.3	mg/l
M250	Mercury (Hg)	0.006	mg/l
OF99	Volatile Organic Scan		
OM32	Butyl Cellosolve	< 0.1	%
OP80	Total PCBs	< 10	mg/kg
OV06	Carbon Tetrachloride	< 8000	mg/l
OV22	Methylene Chloride	< 8000	mg/l
OV25	Toluene	92000	mg/l
OV30	Trichlorofluoromethane	< 8000	mg/l
S015	% Ash at 550 C	< 0.1	%
S040	British Thermal Units	16000	BTU/lb
S064	Chlorine, Organic	< 0.1	%
S090	Flash Point (Pensky-Marten)	< /= 65	F
S098	Fluorine, Organic	< 0.01	%
S168	Specific Weight	7.4	lb/gal
S195	% Water (Karl Fisher)	3.5	%
S210	Viscosity	10	CP
S950	Acid Digestion		
S971	Ashing		
S980	Oxygen Bomb Preparation		
W032	Ammonia - Distillation (as N)	17	mg/l
W435	Nitrogen, Kjeldahl (N)	370	mg/l
W440	Nitrogen, Organic (N)	350	mg/l
W620	Solids, Total at 103 C	113000	mg/l
W765	Total Sulfur (S)-gravimetric	420	mg/l

IDENTIFIED COMPOUNDS	RESULT (mg/L)
4-Methyl-2-Pentanone	42,000
Ethylbenzene	59,000
Total Xylenes	230,000
TENTATIVELY IDENTIFIED COMPOUNDS	**ESTIMATED RESULT (mg/L)**
Hexane,3-Methyl-	6,300
Acetic Acid, Butyl Ester	13,000

COMMENTS:

CAK
6/8/87

Reviewed and Approved by: JMC

CLIENT ORIGINAL

ATTACHMENT 5

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXADRC101
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 9
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PER CENT TOT. SOLIDS	17.01	45.07	27.10	7.760
PER CENT ASH	0.01	0.55	0.17	0.200
PER CENT WATER	48.31	81.21	58.36	9.410
ORGANIC HALOGEN %	0.01	0.80	0.43	0.290
ORGANIC NITROGEN %	0.14	0.99	0.48	0.280
ORGANIC SULFUR %	0.01	0.46	0.11	0.130
HEAVY METALS (ppm)				
ARSENIC	0.00	0.00	0.00	0.000
BARIUM	0.00	2.20	0.63	0.730
BERYLLIUM	0.00	0.00	0.00	0.000
CADMIUM	0.00	1.10	0.37	0.337
CHROMIUM	0.00	4.60	1.06	1.329
LEAD	0.00	269.00	53.28	79.570
MERCURY	0.00	0.00	0.00	0.000
SELENIUM	0.00	0.00	0.00	0.000
SILVER	0.00	3.50	1.00	1.344
ALUMINUM	0.00	64.90	17.59	19.150
ORGANIC CONSTITUENTS %				
MEK	0.00	2.00	0.97	0.620
1-BUTANOL	0.00	0.10	0.01	0.031
MIBK	0.00	9.40	4.38	2.950
TOLUENE	0.00	0.30	0.13	0.094
BUTYL ACETATE	0.00	0.70	0.30	0.226
ETHYL BENZENE	0.00	0.50	0.29	0.145
XYLENE	0.00	2.30	1.52	0.720
BUTYL CELLOSOLVE	0.10	9.20	5.04	2.980
CELLO. ACETATE	0.00	0.00	0.00	0.000
DEG.METHYL ETHER	0.00	0.00	0.00	0.000
HEXYL CELLOSOLVE	0.00	2.10	0.57	0.585
ISOPHORONE	0.00	0.00	0.00	0.000
DEG. BUTYL ETHER	0.00	1.80	0.86	0.512
NAPHTHALENE	0.00	0.00	0.00	0.000
MAK	0.00	0.10	0.01	0.031
ETHYL ACETATE	0.00	0.00	0.00	0.000
ISOBUTYL ACETATE	0.00	0.00	0.00	0.000
ALIPHATIC HYDROCAR	0.00	0.00	0.00	0.000
ALKYL BENZENES	0.00	0.80	0.13	0.270
ISOBUTANOL	0.00	0.10	0.01	0.031
ETHYLENE GLYCOL	0.00	0.00	0.00	0.000
PCB'S	0.00	0.00	0.00	0.000
ETHYL CELLOSOLVE	0.00	2.80	0.31	0.880
METHYLENE CHLORIDE	0.00	0.90	0.27	0.330
TDI	0.00	0.00	0.00	0.000

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXADRC101
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 9
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PHYSICAL PROPERTIES				
VISCOSITY	35	440	119	117.280
TOT. SETT. SOLIDS	0.01	0.01	0.01	0.000
HEATING VALUE	143	8864	5344	2862.490
FLASH POINT	78.00	136.00	85.25	19.180
WEIGHT/GALLON	8.18	8.78	8.41	0.200
pH	5.50	7.00	6.33	0.530

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXADRC102
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 10
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PER CENT TOT. SOLIDS	12.67	63.79	51.38	14.280
PER CENT ASH	0.00	0.37	0.10	0.140
PER CENT WATER	27.92	27.92	27.92	0.000
ORGANIC HALOGEN %	0.00	0.19	0.07	0.050
ORGANIC NITROGEN %	0.00	0.19	0.08	0.060
ORGANIC SULFUR %	0.01	0.13	0.04	0.040
HEAVY METALS (ppm)				
ARSENIC	0.00	0.00	0.00	0.000
BARIUM	0.00	4.60	1.91	1.660
BERYLLIUM	0.00	0.00	0.00	0.000
CADMIUM	0.10	1.40	0.52	0.387
CHROMIUM	0.00	2.30	0.74	0.614
LEAD	0.00	12.10	1.67	3.640
MERCURY	0.00	0.00	0.00	0.000
SELENIUM	0.00	0.00	0.00	0.000
SILVER	0.00	2.10	0.61	0.730
ALUMINUM	0.00	32.10	18.00	10.090
ORGANIC CONSTITUENTS %				
MEK	0.00	22.20	3.70	8.270
1-BUTANOL	0.00	0.00	0.00	0.000
MIBK	0.00	2.00	0.38	0.730
TOLUENE	0.00	0.20	0.03	0.075
BUTYL ACETATE	0.00	0.40	0.07	0.149
ETHYL BENZENE	0.00	0.90	0.15	0.335
XYLENE	0.00	4.30	0.72	1.600
BUTYL CELLOSOLVE	0.00	1.60	0.35	0.590
CELLO. ACETATE	0.00	0.00	0.00	0.000
DEG.METHYL ETHER	0.00	0.00	0.00	0.000
HEXYL CELLOSOLVE	0.00	0.00	0.00	0.000
ISOPHORONE	0.00	0.00	0.00	0.000
DEG. BUTYL ETHER	0.00	0.40	0.08	0.146
NAPHTHALENE	0.00	0.00	0.00	0.000
MAK	0.00	0.00	0.00	0.000
ETHYL ACETATE	0.00	0.00	0.00	0.000
ISOBUTYL ACETATE	0.00	0.00	0.00	0.000
ALIPHATIC HYDROCAR	0.00	2.50	0.42	0.930
ALKYL BENZENES	0.00	2.00	0.33	0.750
ISOBUTANOL	0.00	0.40	0.07	0.149
ETHYLENE GLYCOL	0.00	0.00	0.00	0.000
PCB'S	0.00	0.00	0.00	0.000
ETHYL CELLOSOLVE	0.00	0.00	0.00	0.000
METHYLENE CHLORIDE	0.00	0.00	0.00	0.000
TDI	0.00	0.00	0.00	0.000

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXADRC102
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 10
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PHYSICAL PROPERTIES				
VISCOSITY	50	50	50	0.000
TOT. SETT. SOLIDS	100.00	100.00	100.00	0.000
HEATING VALUE	10107	14556	13010	1649.260
FLASH POINT	78.00	78.00	78.00	0.000
WEIGHT/GALLON	8.69	8.69	8.69	0.000
pH	6.00	6.00	6.00	0.000

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXADRC104
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 2
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PER CENT TOT. SOLIDS	24.30	43.24	33.77	9.470
PER CENT ASH	0.01	0.10	0.06	0.050
PER CENT WATER	38.89	97.73	68.31	29.420
ORGANIC HALOGEN %	0.00	0.01	0.01	0.010
ORGANIC NITROGEN %	0.05	2.01	1.03	0.980
ORGANIC SULFUR %	0.02	0.06	0.04	0.020
HEAVY METALS (ppm)				
ARSENIC	0.00	0.00	0.00	0.000
BARIUM	2.70	6.40	4.55	1.850
BERYLLIUM	0.00	0.00	0.00	0.000
CADMIUM	1.00	1.20	1.10	0.100
CHROMIUM	1.00	2.70	1.85	0.850
LEAD	0.00	8.50	4.25	4.250
MERCURY	0.00	0.00	0.00	0.000
SELENIUM	0.00	0.00	0.00	0.000
SILVER	0.00	0.00	0.00	0.000
ALUMINUM	38.10	45.30	41.70	3.600
ORGANIC CONSTITUENTS %				
MEK	0.00	0.00	0.00	0.000
1-BUTANOL	0.00	0.00	0.00	0.000
MIBK	0.00	0.00	0.00	0.000
TOLUENE	0.00	0.00	0.00	0.000
BUTYL ACETATE	0.00	0.00	0.00	0.000
ETHYL BENZENE	0.00	0.00	0.00	0.000
XYLENE	0.00	0.00	0.00	0.000
BUTYL CELLOSOLVE	0.00	0.00	0.00	0.000
CELLO. ACETATE	0.00	0.00	0.00	0.000
DEG.METHYL ETHER	0.00	0.00	0.00	0.000
HEXYL CELLOSOLVE	0.00	0.00	0.00	0.000
ISOPHORONE	0.00	0.00	0.00	0.000
DEG. BUTYL ETHER	0.00	5.70	2.85	2.850
NAPHTHALENE	0.00	0.00	0.00	0.000
MAK	0.00	0.00	0.00	0.000
ETHYL ACETATE	0.00	0.00	0.00	0.000
ISOBUTYL ACETATE	0.00	0.00	0.00	0.000
ALIPHATIC HYDROCAR	0.00	0.00	0.00	0.000
ALKYL BENZENES	0.00	0.00	0.00	0.000
ISOBUTANOL	0.00	0.00	0.00	0.000
ETHYLENE GLYCOL	0.00	0.00	0.00	0.000
PCB'S	0.00	0.00	0.00	0.000
ETHYL CELLOSOLVE	0.00	0.00	0.00	0.000
METHYLENE CHLORIDE	0.00	0.00	0.00	0.000
TDI	0.00	0.00	0.00	0.000

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXADRC104
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 2
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PHYSICAL PROPERTIES				
VISCOSITY	210	1850	1030	820.000
TOT. SETT. SOLIDS	0.00	0.00	0.00	0.000
HEATING VALUE	200	8367	4284	4083.500
FLASH POINT	78.00	78.00	78.00	0.000
WEIGHT/GALLON	8.51	9.12	8.82	0.310
pH	7.00	8.00	7.50	0.500

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXDRSF111
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 14
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PER CENT TOT. SOLIDS	7.13	96.05	57.02	25.620
PER CENT ASH	0.14	19.46	4.04	6.010
PER CENT WATER	1.13	1.13	1.13	0.000
ORGANIC HALOGEN %	0.00	2.72	0.33	0.710
ORGANIC NITROGEN %	0.00	1.72	0.22	0.530
ORGANIC SULFUR %	0.01	0.10	0.03	0.030
HEAVY METALS (ppm)				
ARSENIC	0.00	0.00	0.00	0.000
BARIUM	0.10	39.00	9.92	10.480
BERYLLIUM	0.00	0.20	0.02	0.058
CADMIUM	0.30	1.70	0.75	0.377
CHROMIUM	0.00	7.50	2.69	2.681
LEAD	0.00	80.10	9.41	21.060
MERCURY	0.00	0.00	0.00	0.000
SELENIUM	0.00	0.00	0.00	0.000
SILVER	0.00	0.40	0.13	0.126
ALUMINUM	11.60	2059.50	242.95	542.940
ORGANIC CONSTITUENTS %				
MEK	0.00	30.90	3.12	9.260
1-BUTANOL	0.00	1.00	0.11	0.298
MIBK	0.00	11.10	1.27	3.310
TOLUENE	0.00	3.70	0.47	1.117
BUTYL ACETATE	0.00	4.80	0.61	1.449
ETHYL BENZENE	0.00	2.60	0.29	0.775
XYLENE	0.00	12.80	1.44	3.820
BUTYL CELLOSOLVE	0.00	4.80	0.59	1.440
CELLO. ACETATE	0.00	0.00	0.00	0.000
DEG.METHYL ETHER	0.00	0.00	0.00	0.000
HEXYL CELLOSOLVE	0.00	34.70	3.47	10.410
ISOPHORONE	0.00	0.00	0.00	0.000
DEG. BUTYL ETHER	0.00	0.10	0.01	0.030
NAPHTHALENE	0.00	0.00	0.00	0.000
MAK	0.00	1.10	0.12	0.328
ETHYL ACETATE	0.00	0.00	0.00	0.000
ISOBUTYL ACETATE	0.00	0.00	0.00	0.000
ALIPHATIC HYDROCAR	0.00	0.50	0.05	0.150
ALKYL BENZENES	0.00	2.40	0.28	0.720
ISOBUTANOL	0.00	0.10	0.01	0.030
ETHYLENE GLYCOL	0.00	0.00	0.00	0.000
PCB'S	0.00	0.00	0.00	0.000
ETHYL CELLOSOLVE	0.00	0.00	0.00	0.000
METHYLENE CHLORIDE	0.00	0.00	0.00	0.000
TDI	0.00	0.00	0.00	0.000

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXDRSF111
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 14
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PHYSICAL PROPERTIES				
VISCOSITY	145	145	145	0.000
TOT. SETT. SOLIDS	0.00	0.00	0.00	0.000
HEATING VALUE	3502	14883	9587	3155.500
FLASH POINT	78.00	78.00	78.00	0.000
WEIGHT/GALLON	8.03	8.03	8.03	0.000
pH	0.00	0.00	0.00	0.000

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXODRF101
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 11
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PER CENT TOT. SOLIDS	31.36	82.20	57.60	14.720
PER CENT ASH	0.02	17.57	3.10	6.480
PER CENT WATER	0.62	19.96	3.61	5.660
ORGANIC HALOGEN %	0.00	0.38	0.06	0.100
ORGANIC NITROGEN %	0.00	0.76	0.15	0.220
ORGANIC SULFUR %	0.00	0.06	0.02	0.020
HEAVY METALS (ppm)				
ARSENIC	0.00	0.00	0.00	0.000
BARIUM	0.10	16.40	4.38	5.640
BERYLLIUM	0.00	0.00	0.00	0.000
CADMIUM	0.30	1.20	0.72	0.301
CHROMIUM	0.00	2.30	1.26	0.620
LEAD	0.00	42.90	5.18	12.500
MERCURY	0.00	0.00	0.00	0.000
SELENIUM	0.00	0.00	0.00	0.000
SILVER	0.00	6.60	1.23	2.254
ALUMINUM	4.80	35.20	16.68	8.130
ORGANIC CONSTITUENTS %				
MEK	0.00	3.50	0.35	1.000
1-BUTANOL	0.00	6.60	1.06	2.279
MIBK	0.00	9.20	2.96	2.820
TOLUENE	0.00	9.50	1.33	2.651
BUTYL ACETATE	0.00	1.90	0.49	0.636
ETHYL BENZENE	0.00	6.10	1.61	2.125
XYLENE	0.00	36.40	9.38	12.770
BUTYL CELLOSOLVE	0.00	26.80	7.37	9.230
CELLO. ACETATE	0.00	0.00	0.00	0.000
DEG.METHYL ETHER	0.00	0.00	0.00	0.000
HEXYL CELLOSOLVE	0.00	0.70	0.13	0.234
ISOPHORONE	0.00	0.00	0.00	0.000
DEG. BUTYL ETHER	0.00	1.30	0.16	0.372
NAPHTHALENE	0.00	0.00	0.00	0.000
MAK	0.00	0.70	0.13	0.226
ETHYL ACETATE	0.00	0.00	0.00	0.000
ISOBUTYL ACETATE	0.00	0.00	0.00	0.000
ALIPHATIC HYDROCAR	0.00	28.70	2.87	8.210
ALKYL BENZENES	0.00	8.60	1.25	2.430
ISOBUTANOL	0.00	0.10	0.01	0.029
ETHYLENE GLYCOL	0.00	0.00	0.00	0.000
PCB'S	0.00	0.00	0.00	0.000
ETHYL CELLOSOLVE	0.00	1.30	0.12	0.374
METHYLENE CHLORIDE	0.00	0.00	0.00	0.000
TDI	0.00	0.00	0.00	0.000

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXODRF101
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 11
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PHYSICAL PROPERTIES				
VISCOSITY	80	22580	3198	6596.150
TOT. SETT. SOLIDS	0.00	0.00	0.00	0.000
HEATING VALUE	7261	16314	14427	2455.720
FLASH POINT	78.00	78.00	78.00	0.000
WEIGHT/GALLON	7.55	8.81	8.17	0.360
pH	0.00	0.00	0.00	0.000

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXODRF102
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 9
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PER CENT TOT. SOLIDS	24.34	77.33	41.93	15.480
PER CENT ASH	0.04	0.07	0.06	0.020
PER CENT WATER	0.34	4.15	1.07	1.110
ORGANIC HALOGEN %	0.00	0.08	0.02	0.030
ORGANIC NITROGEN %	0.03	1.73	0.47	0.570
ORGANIC SULFUR %	0.00	0.06	0.03	0.020
HEAVY METALS (ppm)				
ARSENIC	0.00	0.00	0.00	0.000
BARIUM	0.20	102.90	12.67	31.920
BERYLLIUM	0.00	0.00	0.00	0.000
CADMIUM	0.00	1.00	0.58	0.315
CHROMIUM	0.00	13.20	2.36	3.888
LEAD	0.00	0.70	0.10	0.220
MERCURY	0.00	0.00	0.00	0.000
SELENIUM	0.00	0.00	0.00	0.000
SILVER	0.00	4.60	0.79	1.388
ALUMINUM	3.60	40.20	18.80	11.920
ORGANIC CONSTITUENTS %				
MEK	0.00	0.40	0.14	0.140
1-BUTANOL	0.00	4.30	1.23	1.576
MIBK	0.60	17.80	7.66	5.550
TOLUENE	0.00	60.10	8.10	18.410
BUTYL ACETATE	0.00	46.50	8.97	14.620
ETHYL BENZENE	0.00	4.30	1.19	1.301
XYLENE	0.00	18.60	5.69	5.780
BUTYL CELLOSOLVE	0.00	27.00	7.19	8.780
CELLO. ACETATE	0.00	0.00	0.00	0.000
DEG.METHYL ETHER	0.00	0.00	0.00	0.000
HEXYL CELLOSOLVE	0.00	0.00	0.00	0.000
ISOPHORONE	0.00	0.00	0.00	0.000
DEG. BUTYL ETHER	0.00	26.70	2.97	8.391
NAPHTHALENE	0.00	0.00	0.00	0.000
MAK	0.00	0.60	0.07	0.189
ETHYL ACETATE	0.00	0.00	0.00	0.000
ISOBUTYL ACETATE	0.00	0.00	0.00	0.000
ALIPHATIC HYDROCAR	0.00	20.40	4.66	6.570
ALKYL BENZENES	0.00	4.70	1.16	1.680
ISOBUTANOL	0.00	0.10	0.02	0.042
ETHYLENE GLYCOL	0.00	0.00	0.00	0.000
PCB'S	0.00	0.00	0.00	0.000
ETHYL CELLOSOLVE	0.00	18.40	2.04	5.783
METHYLENE CHLORIDE	0.00	0.70	0.08	0.220
TDI	0.00	0.00	0.00	0.000

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXODRF102
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 9
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PHYSICAL PROPERTIES				
VISCOSITY	25	1870	734	603.830
TOT. SETT. SOLIDS	0.00	0.00	0.00	0.000
HEATING VALUE	13567	16633	15178	1139.170
FLASH POINT	78.00	78.00	78.00	0.000
WEIGHT/GALLON	7.21	9.00	8.07	0.540
pH	0.00	0.00	0.00	0.000

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXCCLF101
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 6
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PER CENT TOT. SOLIDS	10.86	49.89	21.17	13.440
PER CENT ASH	0.09	13.78	3.53	4.890
PER CENT WATER	7.22	90.26	37.68	31.470
ORGANIC HALOGEN %	2.01	60.42	22.73	19.680
ORGANIC NITROGEN %	0.01	0.37	0.12	0.130
ORGANIC SULFUR %	0.02	0.38	0.09	0.130
HEAVY METALS (ppm)				
ARSENIC	0.00	0.00	0.00	0.000
BARIUM	0.60	211.70	38.60	77.540
BERYLLIUM	0.00	0.00	0.00	0.000
CADMIUM	0.30	1.80	0.93	0.502
CHROMIUM	1.00	41.90	8.75	14.840
LEAD	0.00	198.20	40.20	71.270
MERCURY	0.00	0.00	0.00	0.000
SELENIUM	0.00	0.00	0.00	0.000
SILVER	0.00	0.10	0.02	0.037
ALUMINUM	0.00	1058.30	225.60	380.070
ORGANIC CONSTITUENTS %				
MEK	0.00	4.50	1.62	1.650
1-BUTANOL	0.00	0.20	0.06	0.080
MIBK	0.00	3.70	1.36	1.350
TOLUENE	0.00	1.50	0.46	0.546
BUTYL ACETATE	0.00	1.40	0.50	0.537
ETHYL BENZENE	0.00	0.90	0.34	0.307
XYLENE	0.00	4.80	1.72	1.640
BUTYL CELLOSOLVE	0.10	2.30	0.90	0.810
CELLO. ACETATE	0.00	0.00	0.00	0.000
DEG.METHYL ETHER	0.00	0.00	0.00	0.000
HEXYL CELLOSOLVE	0.00	0.00	0.00	0.000
ISOPHORONE	0.00	0.00	0.00	0.000
DEG. BUTYL ETHER	0.00	0.00	0.00	0.000
NAPHTHALENE	0.00	0.00	0.00	0.000
MAK	0.00	0.50	0.10	0.200
ETHYL ACETATE	0.00	0.00	0.00	0.000
ISOBUTYL ACETATE	0.00	0.00	0.00	0.000
ALIPHATIC HYDROCAR	0.00	2.30	0.46	0.920
ALKYL BENZENES	0.00	2.40	0.48	0.960
ISOBUTANOL	0.00	0.10	0.02	0.040
ETHYLENE GLYCOL	0.00	0.00	0.00	0.000
PCB'S	0.00	0.00	0.00	0.000
ETHYL CELLOSOLVE	0.00	0.00	0.00	0.000
METHYLENE CHLORIDE	3.60	48.80	28.84	15.810
TDI	0.00	0.00	0.00	0.000

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXCCLF101
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 6
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PHYSICAL PROPERTIES				
VISCOSITY	35	1145	326	473.050
TOT. SETT. SOLIDS	2.00	50.00	20.67	21.000
HEATING VALUE	1877	8108	5410	2207.580
FLASH POINT	78.00	110.00	86.00	13.860
WEIGHT/GALLON	8.80	9.91	9.31	0.400
pH	2.00	2.00	2.00	0.000

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXOCWF101
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 45
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PER CENT TOT. SOLIDS	0.20	9.65	1.38	1.660
PER CENT ASH	0.00	0.59	0.13	0.190
PER CENT WATER	0.85	100.00	76.03	33.670
ORGANIC HALOGEN %	0.00	0.04	0.01	0.010
ORGANIC NITROGEN %	0.00	1.31	0.14	0.290
ORGANIC SULFUR %	0.00	0.08	0.02	0.020
HEAVY METALS (ppm)				
ARSENIC	0.00	0.00	0.00	0.000
BARIUM	0.00	28.10	2.28	5.630
BERYLLIUM	0.00	0.10	0.00	0.015
CADMIUM	0.00	1.40	0.40	0.344
CHROMIUM	0.00	9.80	0.93	1.669
LEAD	0.00	15.30	0.84	2.690
MERCURY	0.00	0.00	0.00	0.000
SELENIUM	0.00	0.00	0.00	0.000
SILVER	0.00	11.80	1.38	2.681
ALUMINUM	0.00	76.70	9.76	12.690
ORGANIC CONSTITUENTS %				
MEK	0.00	8.50	0.55	1.840
1-BUTANOL	0.00	0.20	0.02	0.058
MIBK	0.00	14.00	2.06	3.470
TOLUENE	0.00	26.60	2.24	4.863
BUTYL ACETATE	0.00	1.80	0.17	0.411
ETHYL BENZENE	0.00	9.80	1.58	2.903
XYLENE	0.00	44.30	6.20	11.330
BUTYL CELLOSOLVE	0.00	2.10	0.24	0.380
CELLO. ACETATE	0.00	0.00	0.00	0.000
DEG.METHYL ETHER	0.00	0.00	0.00	0.000
HEXYL CELLOSOLVE	0.00	0.00	0.00	0.000
ISOPHORONE	0.00	0.00	0.00	0.000
DEG. BUTYL ETHER	0.00	0.10	0.00	0.015
NAPHTHALENE	0.00	0.00	0.00	0.000
MAK	0.00	0.10	0.00	0.015
ETHYL ACETATE	0.00	0.00	0.00	0.000
ISOBUTYL ACETATE	0.00	0.00	0.00	0.000
ALIPHATIC HYDROCAR	0.00	10.50	0.59	2.110
ALKYL BENZENES	0.00	37.50	4.40	9.490
ISOBUTANOL	0.00	0.60	0.03	0.125
ETHYLENE GLYCOL	0.00	0.00	0.00	0.000
PCB'S	0.00	0.00	0.00	0.000
ETHYL CELLOSOLVE	0.00	0.20	0.00	0.029
METHYLENE CHLORIDE	0.00	0.40	0.03	0.090
TDI	0.00	0.00	0.00	0.000

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXOCWF101
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 45
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PHYSICAL PROPERTIES				
VISCOSITY	10	35	12	4.200
TOT. SETT. SOLIDS	0.01	4.00	1.30	1.260
HEATING VALUE	100	18421	4055	6601.770
FLASH POINT	78.00	78.00	78.00	0.000
WEIGHT/GALLON	6.86	8.45	8.16	0.320
pH	2.00	9.00	3.00	1.710

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXSSLF101
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 55
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PER CENT TOT. SOLIDS	10.99	66.33	36.34	11.820
PER CENT ASH	0.00	0.38	0.09	0.090
PER CENT WATER	0.00	30.23	6.41	6.700
ORGANIC HALOGEN %	0.01	0.88	0.22	0.200
ORGANIC NITROGEN %	0.00	2.28	0.39	0.450
ORGANIC SULFUR %	0.00	0.16	0.02	0.030
HEAVY METALS (ppm)				
ARSENIC	0.00	0.00	0.00	0.000
BARIUM	0.00	23.80	1.86	4.300
BERYLLIUM	0.00	0.10	0.00	0.013
CADMIUM	0.00	2.10	0.46	0.396
CHROMIUM	0.00	4.00	0.68	0.734
LEAD	0.00	6.10	0.24	1.020
MERCURY	0.00	0.00	0.00	0.000
SELENIUM	0.00	0.00	0.00	0.000
SILVER	0.00	12.60	1.19	2.369
ALUMINUM	0.00	40.40	10.19	8.760
ORGANIC CONSTITUENTS %				
MEK	0.00	3.50	1.43	0.950
1-BUTANOL	0.00	3.80	0.40	0.565
MIBK	2.00	43.70	13.25	7.640
TOLUENE	0.00	5.70	1.60	1.190
BUTYL ACETATE	0.10	4.50	2.57	1.079
ETHYL BENZENE	0.10	4.20	1.98	1.068
XYLENE	0.60	27.40	11.40	7.010
BUTYL CELLOSOLVE	2.40	23.10	9.59	4.570
CELLO. ACETATE	0.00	0.00	0.00	0.000
DEG.METHYL ETHER	0.00	0.00	0.00	0.000
HEXYL CELLOSOLVE	0.00	2.00	0.35	0.555
ISOPHORONE	0.00	0.40	0.01	0.066
DEG. BUTYL ETHER	0.00	6.20	1.31	1.317
NAPHTHALENE	0.00	0.60	0.04	0.120
MAK	0.00	4.10	0.86	0.750
ETHYL ACETATE	0.00	0.00	0.00	0.000
ISOBUTYL ACETATE	0.00	0.00	0.00	0.000
ALIPHATIC HYDROCAR	0.00	7.00	1.88	2.140
ALKYL BENZENES	0.00	10.30	4.62	2.560
ISOBUTANOL	0.00	1.00	0.27	0.253
ETHYLENE GLYCOL	0.00	0.00	0.00	0.000
PCB'S	0.00	0.00	0.00	0.000
ETHYL CELLOSOLVE	0.00	0.00	0.00	0.000
METHYLENE CHLORIDE	0.00	1.30	0.17	0.320
TDI	0.00	0.00	0.00	0.000

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXSSLF101
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 55
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PHYSICAL PROPERTIES				
VISCOSITY	1	2470	218	388.310
TOT. SETT. SOLIDS	0.01	17.00	6.34	7.580
HEATING VALUE	10232	23335	14376	1968.230
FLASH POINT	78.00	78.00	78.00	0.000
WEIGHT/GALLON	7.30	9.15	8.20	0.380
pH	0.00	0.00	0.00	0.000

ATTACHMENT 6

Faxed to Kirk 6/21/88; AM

ANALYSIS REPORT

LANCY ENVIRONMENTAL SERVICES
DIVISION OF LANCY INTERNATIONAL, INC.
An Alcoa Separations Technology Company
P.O. Box 419
Pittsburgh, PA 15230-0419
Phone (412) 772-0044 • FAX (412) 772-0055

FAX MACHINE (412) 772-1360

PPG - Coatings & Resins
RIDC Park
260 Kappa Drive
Pittsburgh, PA 15238

Attention: Dave Mazzocco

JUN 16 1988

Report Date	6/15/88		
Sample Date	6/2/88	by	JR
Received	6/3/88	by	FM
Analyzed	6/3 - 6/14/88	by	Staff
No. of Samples	3		
Purchase Order #	Verbal		

Analysis of Soil Samples — Project #20818

		INCINERATOR ASH	REFRACTORY BRICK
	CU-88-0155-06	CU-88-0156-06	CU-88-0157-06
Lab Reference #	8060105	8060106	8060107
	(mg/L)	(mg/L)	(mg/L)
TCLP ZHE Leachate			
Acetone	<0.05	<0.05	<0.05
n-butyl-alcohol	<5.0	<5.0	<5.0
Carbon disulfide	<1.05	<1.05	<1.05
Carbon tetrachloride	<0.05	<0.05	<0.05
Chlorobenzene	<0.15	<0.15	<0.15
2-methylphenol (o-cresol)	<2.82	<2.82	<2.82
3-methylphenol (m-cresol)	<2.82	<2.82	<2.82
4-methylphenol (p-cresol)	<2.82	<2.82	<2.82
Cresylic acid	<2.82	<2.82	<2.82
Cyclohexanone	<0.125	<0.125	<0.125
1,2-dichlorobenzene	<0.65	<0.65	<0.65
Ethyl acetate	<0.05	<0.05	<0.05
Ethyl benzene	<0.05	<0.05	<0.05
Ethyl ether	<0.05	<0.05	<0.05
Isobutnol	<5.0	<5.0	<5.0
Methanol	<1.0	<1.0	<1.0
Methylene chloride	<0.20	<0.20	<0.20
Methylene chloride (from pharmaceutical industry)	<12.7	<12.7	<12.7
Methyl ethyl ketone	<0.05	<0.05	<0.05
Methyl isobutyl ketone	<0.05	<0.05	0.140
Nitrobenzene	<0.66	<0.66	<0.66
Pyridine	<1.12	<1.12	<1.12
Tetrachloroethylene	<0.079	<0.079	<0.079
Toluene	<1.12	<1.12	<1.12
1,1,1-trichloroethane	<1.05	<1.05	<1.05
1,1,2-trichloro-1,2,2-trifluoroethane	<1.05	<1.05	<1.05
Trichloroethylene	<0.062	<0.062	<0.062
Trichlorofluoromethane	<0.05	<0.05	<0.05
Xylene	<0.05	<0.05	<0.05

JUN 1988
RECEIVED

C. John Ritzert, Manager-Technical Operations

LANCY ENVIRONMENTAL SERVICES
DIVISION OF LANCY INTERNATIONAL, INC.
An Alcoa Separations Technology Company
P.O. Box 419
Pittsburgh, PA 15230-0419
Phone (412) 772-0044 • FAX (412) 772-0055

ANALYSIS REPORT

PPG - Coatings & Resins
RIDC Park
2 0 Kappa Drive
Pittsburgh, PA 15238

Attention: Dave Mazzocco

Report Date 6/15/88 (Rev. 8/24/88)
Sample Date 6/2/88 by JR
Received 6/3/88 by FM
Analyzed 6/3 - 6/14/88 by Staff
No. of Samples 3
Purchase Order # Verbal

Analysis of Soil Samples

Project #20818

		INCINERATOR ASH	REFRACTORY BRICK
	CU-88-0155-06	CU-88-0156-06	CU-88-0157-06
Lab Reference #	8060105	8060106	8060107
	(mg/L)	(mg/L)	(mg/L)
TCLP ZHE Leachate			
Chlorobenzene	<0.05	<0.05	<0.05
2-methylphenol (o-cresol)	<0.75	<0.75	<0.75
3-methylphenol (m-cresol)	<0.75	<0.75	<0.75
4-methylphenol (p-cresol)	<0.75	<0.75	<0.75
Cresylic acid	<0.75	<0.75	<0.75
1,2-dichlorobenzene	<0.125	<0.125	<0.125
Methanol	<1.0	<1.0	<1.0
Nitrobenzene	<0.125	<0.125	<0.125
Pyridine	<0.33	<0.33	<0.33
Tetrachloroethylene	<0.05	<0.05	<0.05
Toluene	<0.33	<0.33	<0.33
1,1,1-trichloroethane	<0.41	<0.41	<0.41
1,1,2-trichloro-1,2,2-trifluoroethane	<0.96	<0.96	<0.96

C. John Ritzert, Manager-Technical Operations

ATTACHMENT G

U.S. EPA Risk Assessment Forum
Dioxin and Furan Toxicity Equivalence Factor Tables

Interim Procedures for Estimating Risks Associated with Exposures to Mixtures of Chlorinated Dibenzo-*p*-Dioxins and -Dibenzofurans (CDDs and CDFs)

October 1986

Authors
Judith S. Bellin, Ph.D.
Office of Solid Waste and Emergency Response

Donald G. Barnes, Ph.D.
Office of Pesticides and Toxic Substances

Technical Panel
Co-Chairmen: Donald G. Barnes (OPTS)
Hugh L. Spitzer (ORD)

Steven Bayard, Ph.D. (ORD)
Irwin Baumel, Ph.D. (OPTS)
Judith Bellin, Ph.D. (OSWER)
David Cleverly, M.S. (OAQPS)
Frank Gostomski, Ph.D. (ODW/OWRS)
Charalingayya Hiremath, Ph.D. (ORD)
Paul Milvy, Ph.D. (OPPE)
Abe Mittelman, M.S. (OSWER)
Debdas Mukerjee, Ph.D. (ORD)
Charles Nauman, Ph.D. (ORD)
Jerry Stara, Ph.D., D.V.M. (ORD)

Risk Assessment Forum Staff
Dorothy E. Patton, Ph.D., J.D., Executive Director

Risk Assessment Forum
U.S. Environmental Protection Agency
Washington, DC 20460

Table 1. Some Approaches to Estimating Relative Toxicities of PCDDs and PCDFs

Basis/ compound	Swiss[a]	Grant[b] Olie[c] Commoner[d]	New York State[e]	Ontario[f]	FDA[g]	CA[h]	EPA[i] 1981	EPA current recommend.
(Basis)	Enzyme		LD_{50}	Various effects	Various effects			Various effects
Mono thru di CDDs	0	0	0	0	0	0	0	0
Tri CDDs	0	0	0	1	0	0	0	0
2378-TCDD	1	1	1	1	1	1	1	1
other TCDDs	0.01	1	0	0.01	0	0	1	0.01
2378-PeCDDs	0.1	0.1	1	1	0	1	0	0.5
other PeCDDs	0.1	0.1	0	0.01	0	0	0	0.005
2378-HxCDDs	0.1	0.1	0.03	1	0.02	1	0	0.04
other HxCDDs	0.1	0.1	0	0.01	0.02	0	0	0.0004
2378-HpCDDs	0.01	0.1	0	1	0.005	1	0	0.001
other HpCDDs	0.01	0.1	0	0.01	0.005	0	0	0.00001
OCDD	0	0	0	0	<0.00001	1	0	0
2378-TCDFs	0.1	0.1	0.33	0.02	0	1	0	0.1
other TCDFs	0.1	0.1	0	0.0002	0	0	0	0.001
2378-PeCDFs	0.1	0.1	0.33	0.02	0	1	0	0.1
other PeCDFs	0.1	0.1	0	0.0002	0	0	0	0.001

Table 1. (continued)

Basis/ compound	Swiss[a]	Grant[b] Olie[c] Commoner[d]	New York State[e]	Ontario[f]	FDA[g]	CA[h]	EPA[i] 1981	EPA current recommend.
(Basis)	Enzyme		LD_{50}	Various effects	Various effects			Various effects
2378-HxCDFs	0.1	0.1	0.01	0.02	0	1	0	0.01
other HxCDFs	0.1	0.1	0	0.0002	0	0	0	0.0001
2378-HpCDFs	0.1	0.1	0	0.02	0	1	0	0.001
other HpCDFs	0	0.1	0	0.0002	0	0	0	0.00001
OCDF	0	0	0	0	0	0	0	0

[a] Swiss Government, 1982.
[b] Grant, 1977.
[c] Olie et al., 1983.
[d] Commoner et al., 1984.
[e] Eadon et al., 1982.
[f] Ontario, 1982.
[g] U.S. DHHS, 1983.
[h] Gravitz et al., 1983.
[i] U.S. EPA, 1981.

Appendix H

ATTACHMENT H

Documentation of Partial Closure Activities in 1989

REPORT OF CLOSURE ACTIVITIES AND CERTIFICATION OF CLOSURE FOR PPG'S CIRCLEVILLE, OHIO, FACILITY

Submitted to:

PPG Industries, Inc.
Circleville, Ohio

O.H. Materials Corp.

Shirley McMaster

Shirley McMaster, P.E.
Senior Project Engineer

November 17, 1989
Project 7137

TABLE OF CONTENTS

1.0 INTRODUCTION

PPG Industries, Inc. (PPG) is undergoing closure of four RCRA hazardous waste management units. These units are:

- o Still Pad Drum Storage Area
- o South Pad Storage Area
- o West Drum Storage Area
- o Liquid Waste Incinerator Area

PPG is in the process of revising the closure plan for submittal to the Ohio Environmental Protection Agency (Ohio EPA) for final approval.

At PPG's discretion, certain closure activities have taken place prior to the final submittal and subsequent approval of the closure plan. PPG has kept the Ohio EPA advised as to when the closure activities would take place; also, all of Ohio EPA's comments on the closure plan made during the appeal process were taken into account during closure activities. These closure activities have been completed.

2.0 SCOPE OF WORK

OHM was contracted to perform the following tasks:

- Still Pad Drum Storage Area
  - Wash and rinse the pad
  - Collect and drum the rinsewater
  - Sample and analyze the final rinsate
  - Sample and analyze sediment in two grated cover manholes
  - Provide the professional engineer's Closure Certification
- South Pad and West Drum Storage Areas
  - Sample and analyze area soils
  - Remove all concrete pads
  - Provide the professional engineer's Closure Certification
- Liquid Waste Incinerator Area
  - Dismantle the incinerator
  - Sample and analyze area soils
  - Sample and analyze the rinsates from flushing the organic waste and aqueous waste feed lines
  - Remove all concrete pads
  - Provide the professional engineer's Closure Certification

3.0 METHODS

The following sections describe closure activities and analytical methods.

3.1 STILL PAD DRUM STORAGE AREA

The Still Pad Area was an uncurbed concrete pad approximately 80 feet by 100 feet. There were two grated sewer inlets and two sealed sewer manholes located within the pad area.

OHM operations personnel and the professional engineer mobilized to the site on April 17, 1989. There were no drums on the pad. PPG had previously scarified the top 1/4-inch of the pad. This material was placed into 55-gallon drums and disposed of in Chemical Waste Management of Indiana's TSD facility in Fort Wayne, Indiana (ADAMS CENTER).

OHM installed temporary foam curbing around the pad perimeter and the four sewer inlets. The pad was washed twice with an industrial cleaner and rinsed three times with high pressure water lasers. The rinsewater was collected with wet/dry vacuums and placed in drums. Each of the three rinses were placed in separate drums.

At the completion of the third rinse, the foam was removed and placed in separate drums. In all, 15 drums of liquids and solids were generated:

- First rinse--three drums
- Second rinse--four drums
- Third rinse--three drums
- Foam dike--four drums
- Trash, protective clothing--one drum

Samples of the three drums of the third rinse were obtained for analyses. A separate 4 foot long dip tube was used for each drum to ensure sampling of the entire drum contents. Each sample container was filled with equal volumes from each drum.

A sample was also obtained from the plant water used as the rinsewater source. The sample was taken from a tap in the Still House.

OHM also obtained sediment grab samples from the bottom of the two grated cover manholes.

Clean glass containers with Teflon-lined lids were used for all samples. Chain-of-custody forms accompanied all samples.

All 15 drums of rinsate and debris were incinerated on site at the hazardous-waste incinerator.

3.2 SOUTH PAD STORAGE AREA

The South Pad is a gravel area, approximately 90 feet by 240 feet. There is a curbed concrete pad, approximately 15 feet by 45 feet located on the south side of the area.

OHM sampling personnel mobilized to the site on July 17, 1989, to perform soil sampling on the South Pad Storage Area, the West Drum Storage Area, and the Liquid Waste Incinerator Area.

Using a grid established by PPG, and the edge of an existing concrete pad as the western boundary of the South Pad, OHM located the sample points. A sample was taken from the center of each box shown as shaded on Figure 3.1.

A power auger was used to remove the top 4 to 6 inches. The loose soil was removed and a grab sample collected using a tongue depressor where necessary to loosen the soil. The samples were placed in clean glass 40 milliliter (ml) vials with Teflon septa.

The power auger bit was decontaminated using a soap and water wash and distilled water rinse between each location.

The sample gloves and tongue depressors were discarded after each location. All samples were labeled and transferred to the laboratory in coolers. Chain-of-custody forms accompanied all samples.

The holes were backfilled after the sample had been obtained. The decontamination water was placed in one drum, and trash and debris placed in another drum.

On November 7, 1989, the concrete containment pad was broken up, removed, and transported to ADAMS CENTER.

3.3 WEST DRUM STORAGE AREA

The West Drum Storage Area is a gravel area, approximately 10 feet by 100 feet.

Using a grid supplied by PPG and an existing monitoring well as the northwest corner of the area, OHM located the sample points. These points are shown in Figure 3.2.

The samples were obtained in a fashion similar to that described in Section 3.2 for the South Pad Storage Area.

3.4 LIQUID WASTE INCINERATOR AREA

The liquid waste incinerator has been taken out of service.

G

PLOT SC 1" = 1'

OHM PGH PITTSBURGH, PA | DRAWN BY

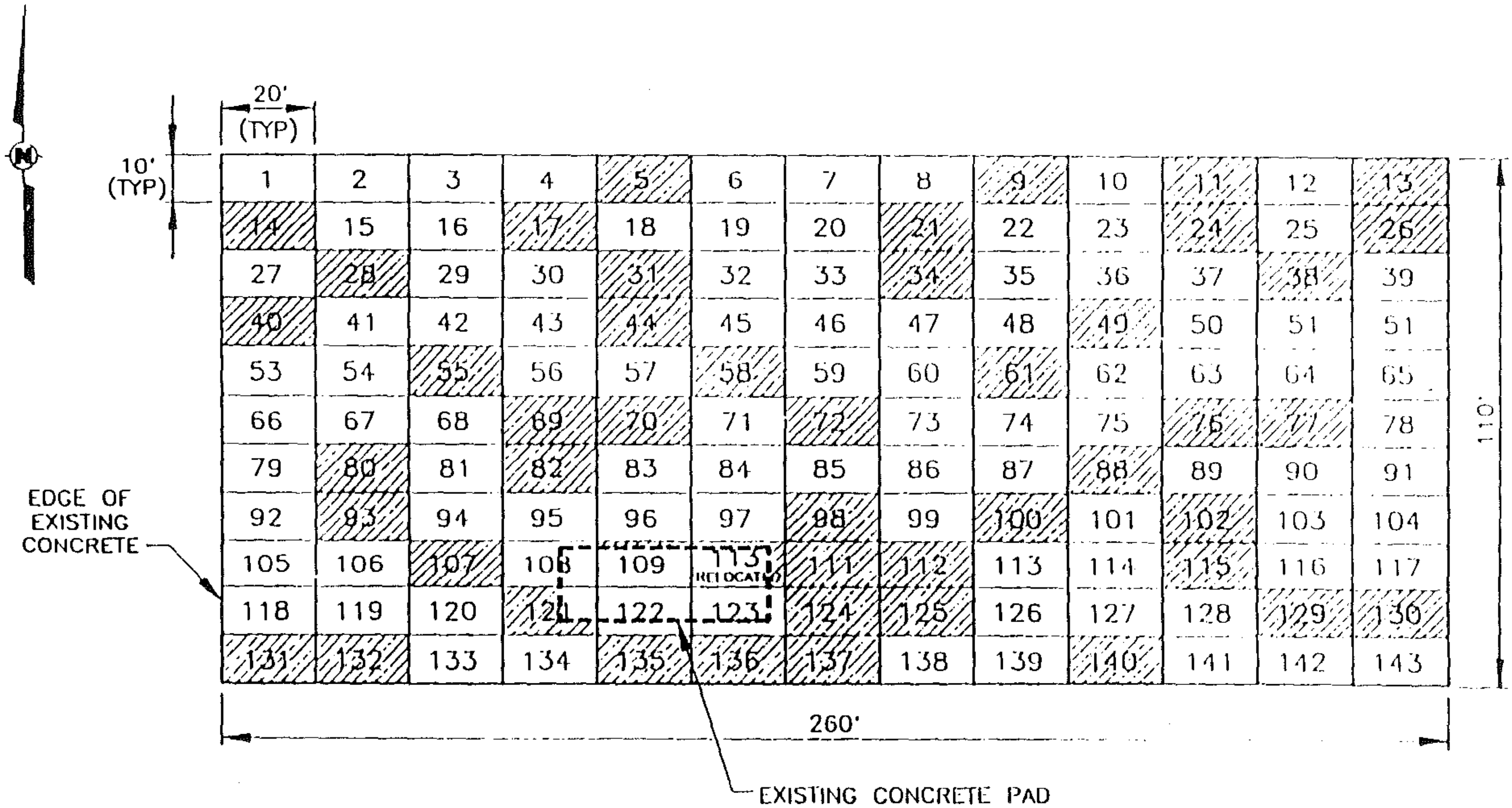


FIGURE 3.1

SOUTH PAD
SAMPLE LOCATION MAP

PREPARED FOR

PPG INDUSTRIES
CIRCLEVILLE, OHIO

OHM Corporation

OHM CORPORATION | DRAWN | CHECKED BY
REV. BY | C.MERRIN

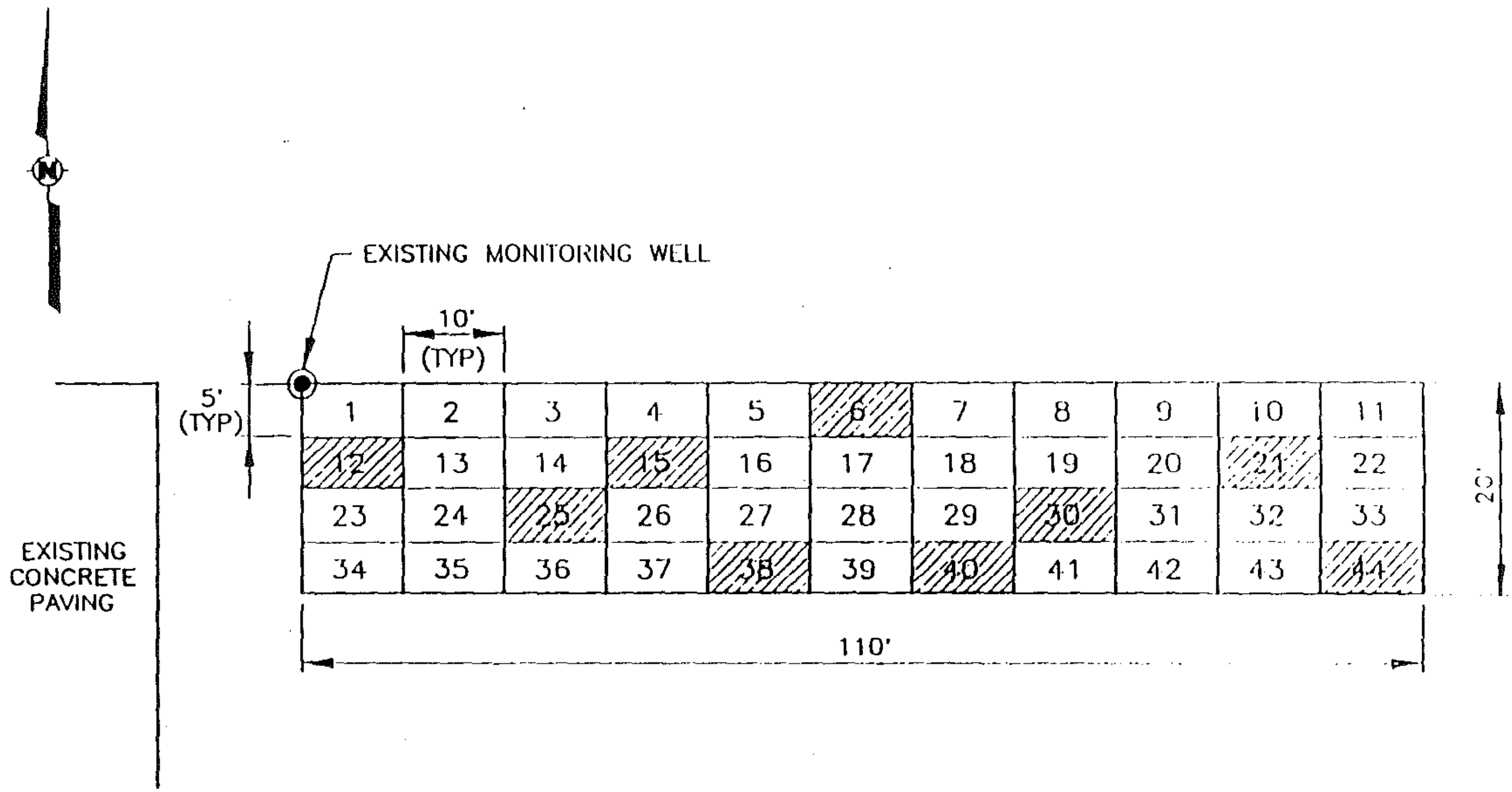


FIGURE 3.2

WEST PAD
SAMPLE LOCATION MAP

PREPARED FOR

PPG INDUSTRIES
CIRCLEVILLE, OHIO

OHM Corporation

On June 5, 6, and 7, 1989, OHM dismantled the incinerator hearth, breech, and stack, and loaded them into trucks for transport to ADAMS CENTER.

3.4.1 Soil Sampling

An area surrounding the incinerator pad was selected for soil sampling. The incinerator occupied a concrete pad approximately 10 feet by 40 feet along with a 20 foot square concrete containment area. The area to be sampled was 90 feet by 110 feet.

Using PPG's sampling grid, OHM located the sample points shown on Figure 3.3. The northwest corner of the area was selected 23 feet north and 29 feet west of the corner of the incinerator pad. Three samples were relocated in the field: Location 9 was moved south and east to avoid an existing equipment pad; Location 48 was moved east off the incinerator pad; Location 78 was moved east outside an electrical substation.

All soil sampling activities were similar to those described in Section 3.2, South Pad Storage Area.

3.4.2 Line Flushing

There were three pipelines at the Liquid Waste Incinerator that carried hazardous materials. Two of the lines were designated as organic waste feed lines and the other as an aqueous waste feed line. The lines were flushed and drained when the incinerator was taken down. The lines were to be flushed again as part of the closure activities.

OHM's professional engineer was on site on August 24, 1989, to witness the flushing and obtain rinsate samples.

The two organic feed lines were flushed first. A recycle line on the pipe rack was used to recirculate the solvent solution. For each organic line, solvent was circulated at least three times and then sent to PPG's on-site hazardous-waste incineration facility.

Following the solvent flushing, service water was used for the final flushing. Three rinses with clean water were performed. Each rinse was segregated in a separate drum and sent to the on-site incinerator.

The aqueous waste line was flushed three times with deionized water. Each rinse was segregated in a separate drum and incinerated on site.

PLOT S	1" = 1'	OHM CORPORATION PITTSBURGH, PA	DRAWN	CHECKED BY	APPROVED BY	DRAWING REF	A2
		DRAWN BY	C.MERRIN 11-17-89				

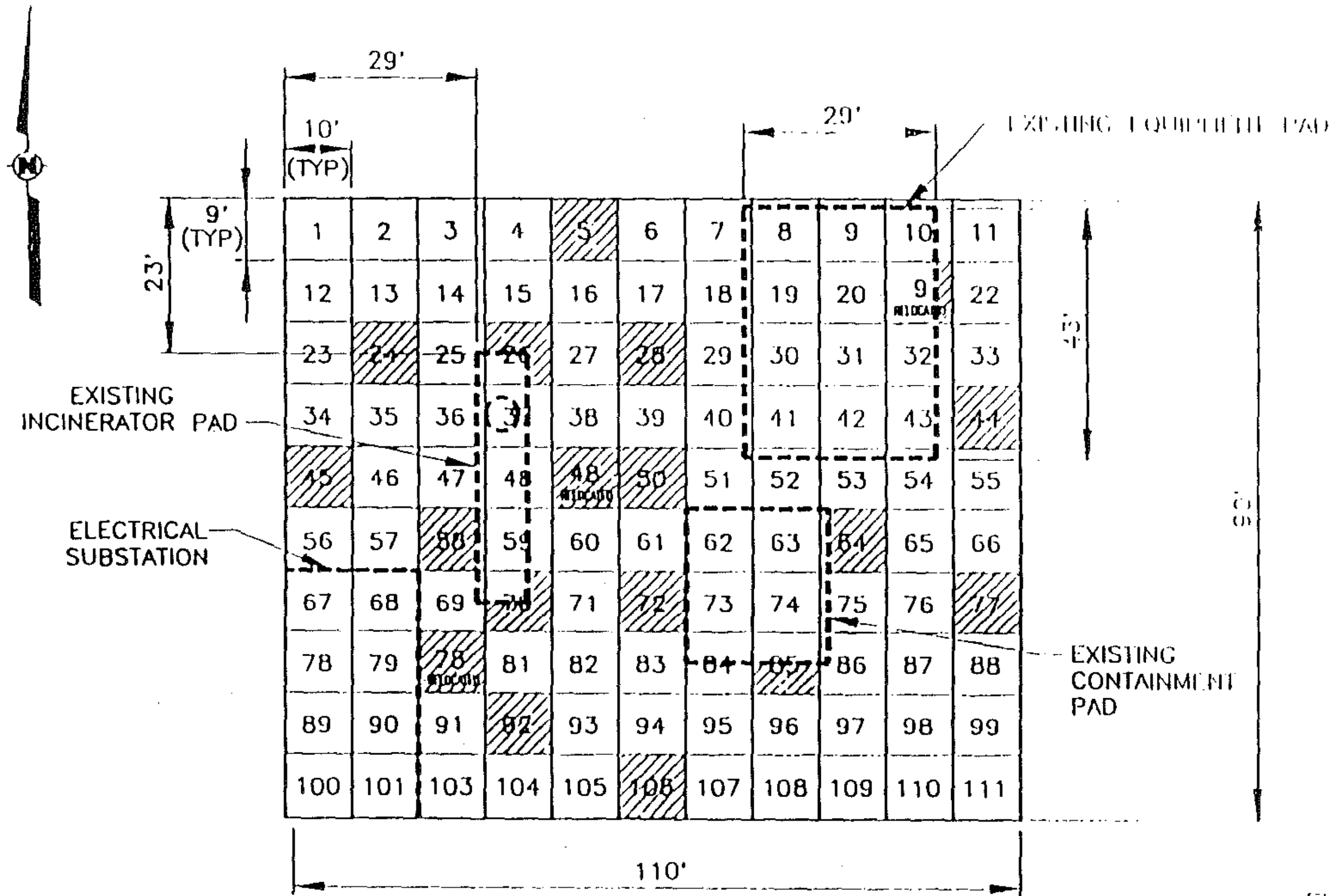


FIGURE 3.3

INCINERATOR AREA SAMPLE LOCATION MAP

PREPARED FOR

PPG INDUSTRIES
CIRCLEVILLE, OHIO

OHM Corporation

The three final rinsewaters were sampled. Four-foot long dip tubes were used to ensure a representative sample was obtained from each drum. Samples were also taken from the hose used to supply the service water and a drum of the clean deionized water. The samples were placed in clean glass jars with Teflon-lined lids. Clean dip tubes and sample gloves were used to take each sample. The containers were held in coolers during transport to the laboratory. Chain-of-custody forms accompanied all samples.

3.4.3. Concrete Removal

On November 7 and 8, 1989, OHM removed the concrete incinerator pad and containment. The footings for the incinerator pad were removed to a few inches below grade. The concrete was transported to ADAMS CENTER.

3.5 ANALYTICAL METHODS

All the samples obtained (soils, rinsates, and source waters) were analyzed for F003 and F005 solvents using the following methods:

- Alcohols--Samples were prepared and analyzed according to USEPA Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods, EPA SW-846, 2nd edition, July 1982; Method 5030, Purge and Trap, and Method 8015, Nonhalogenated Volatile Organics.

- Volatile Priority Pollutants--Samples were prepared and analyzed according to USEPA Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods, SW-846, 3rd edition, September 1986; Method 8240, GC/MS Method for Volatile Organics.

The final rinsate at the Still Pad Storage Area was also analyzed for methylene chloride and acrylonitrile by the above methods and for PCBs by the following method:

- PCBs--The water sample was prepared and analyzed according to USEPA Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater, July 1982; Method 608, Pesticides and PCBs.

The soil samples at the South Pad Storage Area, West Drum Storage Area, and the incinerator area were composited and analyzed for PCBs according to the following method:

- USEPA Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods, SW-846, 2nd edition, July 1982; Method 3550, Sonication or Method 3540, Soxhlet Extraction and Method 8080, Organochlorine Pesticides and PCBs.

The samples at the South Pad were composited into two samples--one encompassing samples S-131, 003 through 14, and 016 through 026; the other samples 027 through 032, and 034 through 051. The 18 nonduplicate samples at the West Drum Storage Area were composited into one sample and the nine non-duplicate samples at the incinerator area were composited into one sample.

The composite soil sample from the incinerator area was analyzed for the following:

- Polychlorinated Dibenzo-P-Dioxins and Furans, namely 2,3,7,8-TCDD and 2,3,7,8-TCDF--Sample was prepared and analyzed according to USEPA *Methods for Evaluating Solid Wastes, Physical/Chemical Methods*, SW-846, 3rd edition, November 1986; Method 8280, GC/MS Method for Polychlorinated Dibenzo-P-Dioxins and Furans.

4.0 RESULTS

The following paragraphs discuss the results of the closure activities.

4.1 STILL PAD DRUM STORAGE PAD

Of the F003 and F005 solvents analyzed, none were detected in the still pad final rinsate sample. There were no PCBs, acrylonitrile, or toluene diisocyanate detected in the final rinsate. Methylene chloride was detected at 169 parts per billion (ppb).

The rinsate was sent to PPG's Circleville incineration facility. The concrete pad was demolished and sent to ADAMS CENTER. The drums of debris from the scarification of the pad were also sent to ADAMS CENTER.

4.2 SOUTH PAD STORAGE AREA

The results of the F003 and F005 analyses on the 50 soil samples have been summarized in Table 4.1. Only those 16 sample points which had detectable concentrations are shown in the table. One composite sample had 0.334 ppm PCBs, the other 3.56 ppm PCBs. These soils will be addressed at a future time.

4.3 WEST DRUM STORAGE AREA

A total of 10 samples were taken at the West Drum Storage Area. The F003 and F005 solvent concentrations have been summarized in Table 4.2. There were only four locations which had detectable concentrations. There were no PCBs detected in the composite sample. The soils in these areas will be addressed at a future time.

4.4 LIQUID WASTE INCINERATOR AREA

There were 19 soil samples taken at the incinerator area. Detectable F003 and F005 concentrations have been summarized in Table 4.3. Only nine locations were above detection limits. There was 1.79 ppm PCBs detected in the composite sample. There was 0.15 ppb of 2,3,7,8-TCDF present in the composite sample while the 2,3,7,8-TCDD was below detectable limits. The soils at these locations will be addressed at a future time.

The rinsate sample analyses for the aqueous waste and organic waste feed lines are summarized in Table 4.4. Detectable concentrations of several F003 and F005 solvents were present in all three final rinsates. The pipe was dismantled; no solids or residue were visible in the pipes. The pipes were sent to ADAMS CENTER for disposal.

TABLE 4.1

F003 AND F005 SOLVENTS
ANALYTICAL SUMMARY
SOILS - SOUTH PAD STORAGE AREA

Compounds Detected (ppm)

Sample Number	Location	Toluene	Total Xylenes	Ethylbenzene
S-131	S-131	2	BDL	BDL
004	S-135	BDL	0.11	BDL
005	S-136	0.8	BDL	BDL
010	S-125	0.4	BDL	BDL
013	S-107	0.4	BDL	BDL
015	S-109	BDL	0.6	BDL
018	S-112	0.4	BDL	BDL
021	S-100	21	8	2
024	S-80	0.5	BDL	BDL
025	S-88	2	BDL	BDL
028	S-76	17	BDL	0.3
029	S-72	BDL	BDL	0.4
031	S-69	1	1.8	0.3
034	S-58	0.3	BDL	BDL
035	S-61	0.3	BDL	BDL
038	S-40	0.4	BDL	BDL
Detection Limit	N/A	0.3	0.3	0.3

BDL = Belov Detection Limit

TABLE 4.2

F003 AND F005 SOLVENTS
ANALYTICAL SUMMARY
SOILS - WEST PAD STORAGE AREA

Compounds Detected (ppm)

Sample Number	Location	Methanol	Toluene	Ethylbenzene	m+p-Xylene	o-Xylene
053	W-44	0.988	1.34	BDL	BDL	BDL
057	W-06	BDL	BDL	0.229	1.14	1.02
058	W-38	BDL	0.621	BDL	BDL	BDL
061	W-12	BDL	BDL	BDL	0.225	0.229
Detection Limit	N/A	.988	.19	.19	.19	.19

BDL = Below Detection Limit

TABLE 4.3

F003 AND F005 SOLVENTS
ANALYTICAL SUMMARY
SOILS - INCINERATOR AREA

Compounds Detected (ppm)

Sample Number	Location	Ethylbenzene	Total Xylenes
066	I-64	0.3	0.9
067	I-85	0.6	0.7
070	I-72	BDL	1.7
072	I-70	BDL	BDL
077	I-24	2	4
078	I-28	BDL	BDL
079	I-48	BDL	0.4
080	I-45	0.6	2
081	I-50	BDL	BDL
Detection Limit	N/A	0.3	0.3

BDL = Below Detection Limit

TABLE 4.4

F003 AND F005 SOLVENTS
ANALYTICAL SUMMARY
LIQUIDS - INCINERATOR AREA

Concentration (ppm)

Item	Methanol	Isobutanol	Butanol	Ethyl-benzene	Toluene	Total Xylenes
Organic Waste Line 1	16.5	1.71	18.9	24	33	180
Organic Waste Line 2	93.1	10.1	85.3	36	75	240
Aqueous Waste	BDL	BDL	BDL	9.9	15	31
Service Water	BDL	BDL	BDL	BDL	BDL	BDL
Deionized Water	BDL	BDL	BDL	BDL	.17*	BDL
Detection Limit	1.0	1.0	1.0	0.5	0.5	0.5

*Detection Limit - 5 parts per billion

5.0 CONCLUSIONS

The closure activities completed to date have been consistent with the specifications set forth in Ohio Administrative Code 3745-66-12 and the Ohio Environmental Protection Agency's Draft Closure Plan Review Guidance dated February 8, 1988.

CV-PCLP-1-D1

PARTIAL CLOSURE PLAN

PPG INDUSTRIES, INC.
CIRCLEVILLE OHIO

Prepared For:

PPG INDUSTRIES, INC.
Coatings and Resins
Circleville, Ohio

February 1993

Prepared By:

ICF KAISER ENGINEERS, INC.
Four Gateway Center
Pittsburgh, Pennsylvania 15222

ICF KAISER ENGINEERS

CV-PCLP-7-D1

PPG INDUSTRIES, INC.
CIRCLEVILLE, OHIO
PARTIAL CLOSURE PLAN
PLAN DISTRIBUTION LIST

Distribution to:	CV-PCLP Controlled Copy No.
Mr. Christopher Korleski, Esq Assistant Attorney General 30 East Broad Street - 25th Floor Columbus, Ohio 43215	1-D1
Mr. Brad Campbell Ohio EPA Central District Office P. O. Box 2198 2305 Westbrook Drive, Building C Columbus, Ohio 43228	2-D1
Mr. Lundy Adelsberger Ohio EPA Central District Office P. O. Box 2198 2305 Westbrook Drive, Building C Columbus, Ohio 43228	3-D1
Ms. Sandy Liebfritz Supervisor, Technical Support (DERR) Ohio EPA - Central Office 1800 Watermark Drive Columbus, Ohio 43266-0149	4-D1
Charles H. Waterman, Esq. Bricker and Eckler 100 South Third Street Columbus, Ohio 43215	5-D1
Ms. Marian Broz Manager, Hazardous Waste Programs PPG Industries, Inc. P. O. Box 2009 4325 Rosanna Drive Allison Park, Pennsylvania 15101-2009	6-D1
Mr. Bryant Riley Environmental Engineer PPG Industries, Inc. Route 23 South (Pittsburgh Road) Circleville, Ohio 43113	7-D1
Mr. Robert S. Bear Project Manager ICF Kaiser Engineers, Inc. Four Gateway Center Pittsburgh, Pennsylvania 15222	8-D1

PARTIAL CLOSURE PLAN
TABLE OF CONTENTS

TABLE OF CONTENTS
(Continued)

LIST OF TABLES
(Tables follow Text)

LIST OF FIGURES
(Figures follow Text)

LIST OF ATTACHMENTS

PREFACE

This Partial Closure Plan is designed to close four interim status hazardous waste management units in a manner that 1) minimizes the need for further maintenance, and 2) controls, minimizes, or eliminates (to the extent necessary to protect human health and the environment) post-closure escape of hazardous wastes, hazardous waste constituents, leachate, contaminated rainfall, or waste decomposition products to the groundwater, surface water, or to the atmosphere in accordance with the following applicable federal and state regulations:

Federal:	40 CFR Subpart G, Sections 265.110-115, 265.140-143, 265.147, 265.197 and 265.351
State:	OAC 3745-66-10 through 20 OAC 3745-66-40 through 47 OAC 3745-66-98 OAC 3745-68-51

This revision of the Partial Closure Plan incorporates the responses to all issues identified by Ohio EPA since submittal of the January 14, 1991 Plan. PPG had responded to Ohio EPA's comments in a written, itemized response format with the understanding that once concurrence was reached on all issues identified by Ohio EPA, the January 1991 Partial Closure Plan would be revised to reflect the resolved issues. *To facilitate review,* new/clarified text has been highlighted in shaded type. *Changes made to the January 7, 1993 Plan are presented in shaded, italicized type.*

This Partial Closure Plan outlines closure procedures that were performed for the liquid waste incinerator and three drum storage areas at the PPG Circleville resin plant. This plan documents the results of the work completed through the end of 1992, *as well as incorporates responses to OEPA comments in 1993* and provides risk assessment criteria to demonstrate the remaining low level residuals do not pose a threat to human health or the environment.

Since this plan is written to describe activities already performed, appropriate documentation such as analytical results for the work performed is attached.

The schedule for past work is presented with actual calendar dates to document when the work was performed. It should be noted that the overall facility closure plan, which included a partial closure plan for the liquid waste incinerator and three drum storage pads, was approved by both Ohio EPA and U.S. EPA in November 1987. All work performed to date has been in accordance with the original approved plan and continuing correspondence with OEPA.

The partial closure of the liquid waste incinerator and drum storage areas began in April of 1989 after notice from the U.S. EPA and Ohio EPA that trial burn results for the Energy Recovery

Unit (ERU) were satisfactory. These areas were permitted as storage and treatment locations under RCRA Interim Status, but will not be retained under Final Permit Status. Figure 6.1 provides a bar chart schedule for partial closure activities performed from April through November, 1989. The Ohio EPA's facility inspector was contacted in advance of crucial closure activities, such as decontamination, soil sampling or removal. The actual dates when the Ohio EPA inspector was on site are documented on the schedule. Section 6.0 of this plan also summarizes key activities that have occurred since November, 1989.

Within 60 days of completing closure activities, PPG will submit the appropriate documentation that closure has been completed in accordance with the approved closure plan (i.e., soil sample analysis results, closure certification statements). The certification by the independent professional engineer and PPG will be in accordance with OAC Rules 3745-50-42 and 3745-50-42(D), respectively.

1. DESCRIPTION OF FACILITY

PPG Industries, Inc., Coatings and Resins Group, owns and operates a manufacturing plant south of Circleville, Ohio in Pickaway County as shown on the site location map (Figure 3.1). The surrounding area is classified as industrial and agricultural. The nearest residential development is approximately one-half mile from the plant boundary. Eight major buildings are located on the property of this facility, which encompasses approximately sixty acres. The general topography of the area is flat.

The facility was originally constructed in 1962. The plant produces resins that are used in the manufacturing of paint and coating products at other PPG divisional manufacturing facilities located throughout the world. During the production of resins and paints, wastes are generated from the cleaning of process equipment, filtering of products, byproducts of reactions, and unusable finished products or raw materials.

The Circleville facility previously was permitted under Interim Status to store wastes in drums and tanks and to treat liquids by incineration. The former locations of the Liquid Waste Incinerator and the West Pad, South Pad, and Still Pad drum storage areas are indicated in Figure 3.2. Wastes from the Circleville facility possess the hazardous characteristics of ignitability, corrosivity, reactivity and/or toxicity characteristic. The incineration process destroyed the ignitable, corrosive, reactive, and organic toxicity properties of the wastes. The incinerator operated for approximately seventeen years (1971-1988) and the drum storage pads were used for periods of five to twenty-four years. The EPA Facility Identification Number for the PPG Circleville Plant is OHD004304689.

In 1987, the Energy Recovery Unit (ERU) began operation at the Circleville facility. The ERU currently receives PPG waste materials from plants throughout North America and processes them for thermal treatment by incineration. The wastes are reduced to a small fraction of their original volume, and the energy value of the waste is recovered in the form of steam to help meet the total energy requirements of the manufacturing plant.

Following the startup and operation of the ERU and the Circleville facility, five hazardous waste storage tanks were kept in service at the resin plant. The former liquid waste incinerator and three drum storage pads were closed in 1989 in accordance with Interim Status regulatory requirements and as documented in this Partial Closure Plan.

The following sections present the Partial Closure Plan for the four interim status hazardous waste management units which were closed in 1989 at the PPG Circleville site. This Partial Closure Plan presents a clean closure of the Still pad and risk assessment demonstration of clean closure of the Former Liquid Waste Incinerator, the West Drum Storage Pad, and the South Drum Storage Pad.

2. DESCRIPTION OF WASTE MANAGEMENT UNITS CLOSED UNDER PARTIAL CLOSURE

The units closed in 1989 were the Liquid Waste Incinerator, the West Storage Pad, the South Pad and the Still Pad. Closure activities included cleaning or removal of the concrete pads and the underlying soils and removal and disposal of the incinerator.

The following descriptions of the closure units are based in part on information contained in the RCRA Interim Status permit.

2.1 Liquid Waste Incinerator -- (refer to Figure 4.1 for a detailed drawing of this hazardous waste management unit)

The unit consisted of a liquid waste incinerator with three (3) lances (two for organic wastes and one for aqueous wastes), which fed wastes to the hearth. Other components of the unit included a breech, containing a temperature recorder that controlled the waste feed pumps, and a discharge stack, containing a quench water system. The incinerator had been in use since 1971. Ancillary equipment to the incinerator consisted of three (3) waste lines that fed directly into the lances and a blower that added combustion air and created air turbulence in the incinerator hearth. The incinerator area also included a concrete containment area located southeast of the incinerator pad. The topography of the area is flat. Wastes treated in the incinerator included the following:

D001 -	Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methyl isobutyl ketone, methanol, toluene or methyl ethyl ketone)
D001 - D002 D035	Aqueous Decanter Waste (aqueous phase byproduct from resin manufacturing process, containing VOCs and organic acids)
F003 -	Still sludge including xylene, ethylbenzene and methyl isobutyl ketone
F005 -	Still sludge including toluene and methyl ethyl ketone

The previous Partial Closure Plan submitted to OEPA included methanol as a component of the F003 waste listing. However, the methanol treated at the facility was only associated with the waste resin material (D001).

2.2 Waste Drum Storage Area, Still Pad -- (refer to Figure 4.2 for a detailed drawing of this hazardous waste management unit)

The unit consisted of a concrete pad, approximately 80' x 100', on which waste drums were stored. The pad had been in use since 1965. The area is flat. Wastes stored on the pad included the following:

D001 -	Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methyl isobutyl ketone, methanol, toluene or methyl ethyl ketone)
F002 -	Spent methylene chloride
F003 -	Incinerator brick and residue generated by the incineration of F003 wastes
F005 -	Incinerator brick and residue generated by the incineration of F005 wastes
U009 -	Waste acrylonitrile
U223 -	Waste toluene diisocyanate

Drums containing lab packs

2.3 Waste Drum Storage Area, West Pad -- (refer to Figure 4.3 for a detailed drawing of this hazardous waste management unit)

The unit consisted of a flat area covered by packed gravel. The storage pad was approximately 10'x100'. This unit was in use from 1975-1985. Waste stored in this area included the following:

D001 -	Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methyl isobutyl ketone, methanol, toluene or methyl ethyl ketone)
F002 -	Spent methylene chloride

2.4 Drum Storage Area, South Pad -- (refer to Figure 4.4 for a detailed drawing of this hazardous waste management unit)

This unit consisted of a flat, packed gravel area approximately 90'x240'. This area contained a consolidation platform with a concrete containment pad underneath. The pad had been in use since 1976. Wastes stored in this area included the following:

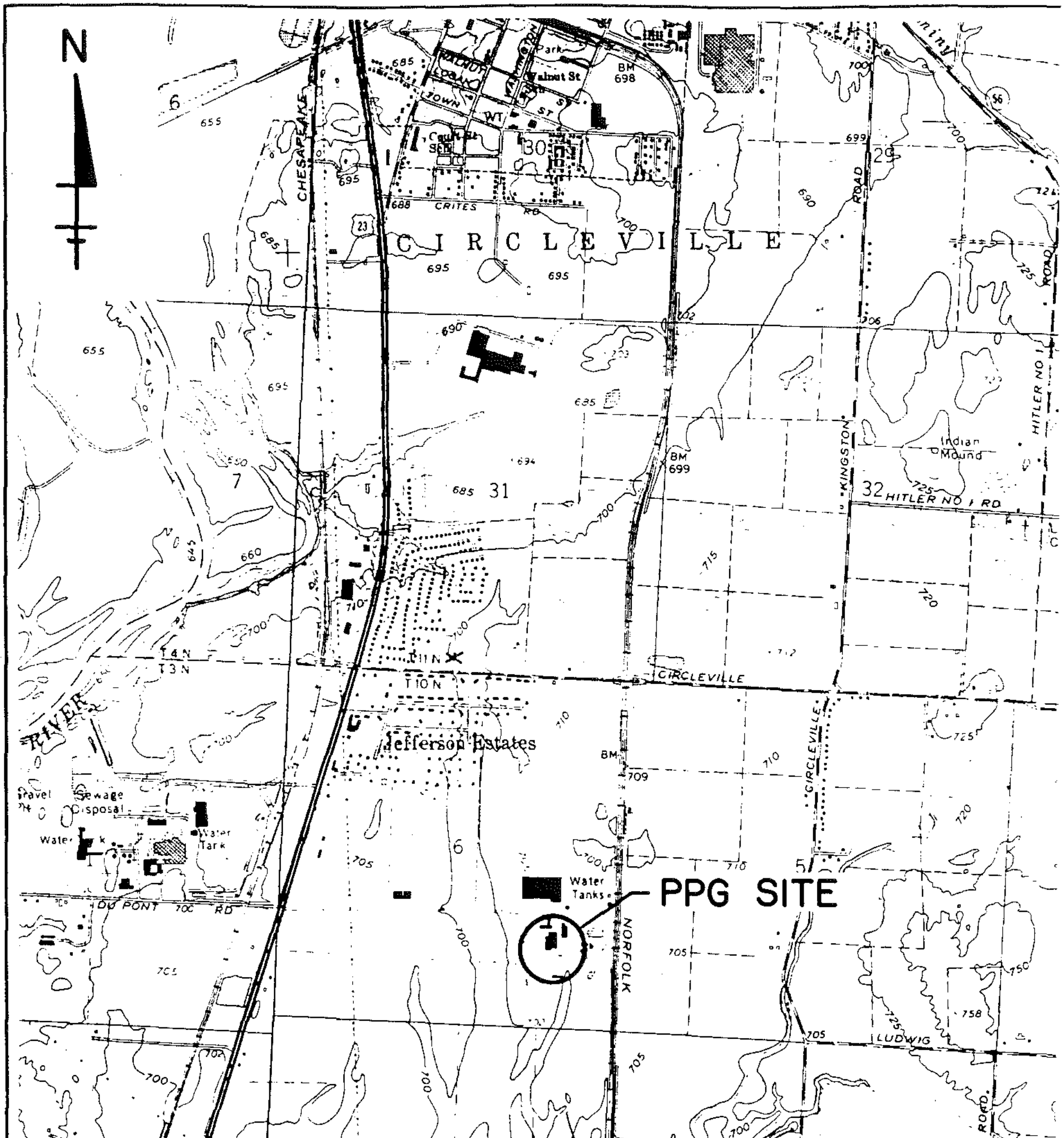
D001 - Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methyl isobutyl ketone, methanol, toluene or methyl ethyl ketone)

3. MAPS OF FACILITY

This Section contains two facility maps as required by OEPA Closure Plan Review Guidance. These two figures locate the facility units which were closed within the site property boundaries, located in Pickaway County.

Figure 3.1 is the Facility Location Map and Figure 3.2 depicts the Interim Status Hazardous Waste Management Unit Locations, highlighting the closed units. The scales on these figures are noted.

Figure 3.1 - Facility Location Map
Figure 3.2 - Interim Status Hazardous Waste Management Unit Locations



REFERENCE
U.S.G.S. 7.5' TOPOGRAPHIC MAP, CIRCLEVILLE, OH
QUADRANGLE DATED: 1961, PHOTOREVISED: 1974

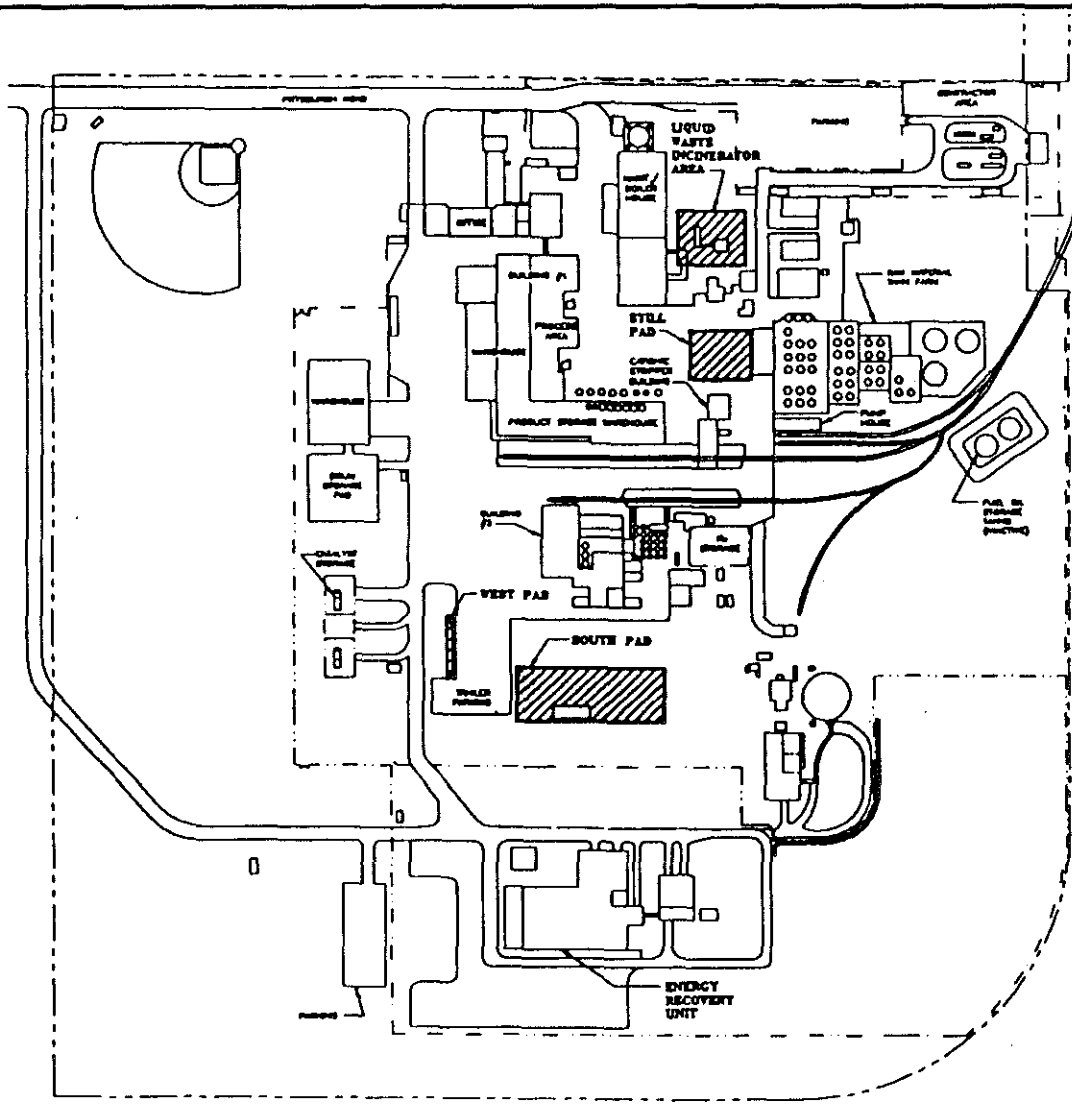
FIGURE 3.1

PPG INDUSTRIES INC. CIRCLEVILLE, OHIO	SITE LOCATION MAP
ICF KAISER ENGINEERS PITTSBURGH, PA.	DATE: AUG. 21, 1992	DR.: D. BRENT SCALE: 1" = 2000'	DWG. NO.: 04830

DRAWING 78207 FORM # 4664

JOB NO.: 0451200100 PLOT SCALE: 1=1

STARTED ON: 1/6/93 REVISED: 0/00/00



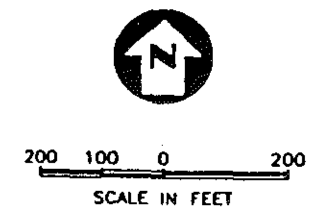


FIGURE 3.2

PPG INDUSTRIES, INC. CIRCLEVILLE, OHIO	PLOT PLAN— INTERIM STATUS HAZARDOUS WASTE MANAGEMENT AREAS
ICF KAISER ENGINEERS PITTSBURGH, PA	DATE: 1/6/93 DR.: D.MAJERNIK SCALE: AS NOTED DWG. NO.: FIG3-2

4. DETAILED DRAWINGS OF UNITS TO BE CLOSED

This Section contains the detailed figures of the closed units as specified by OEPA Closure Plan Review Guidance. The figures are labeled as follows:

JOB NO.: 0451200100 PLOT SCALE: 1=1

STARTED ON: 1/5/93 REVISED: 0/00/00

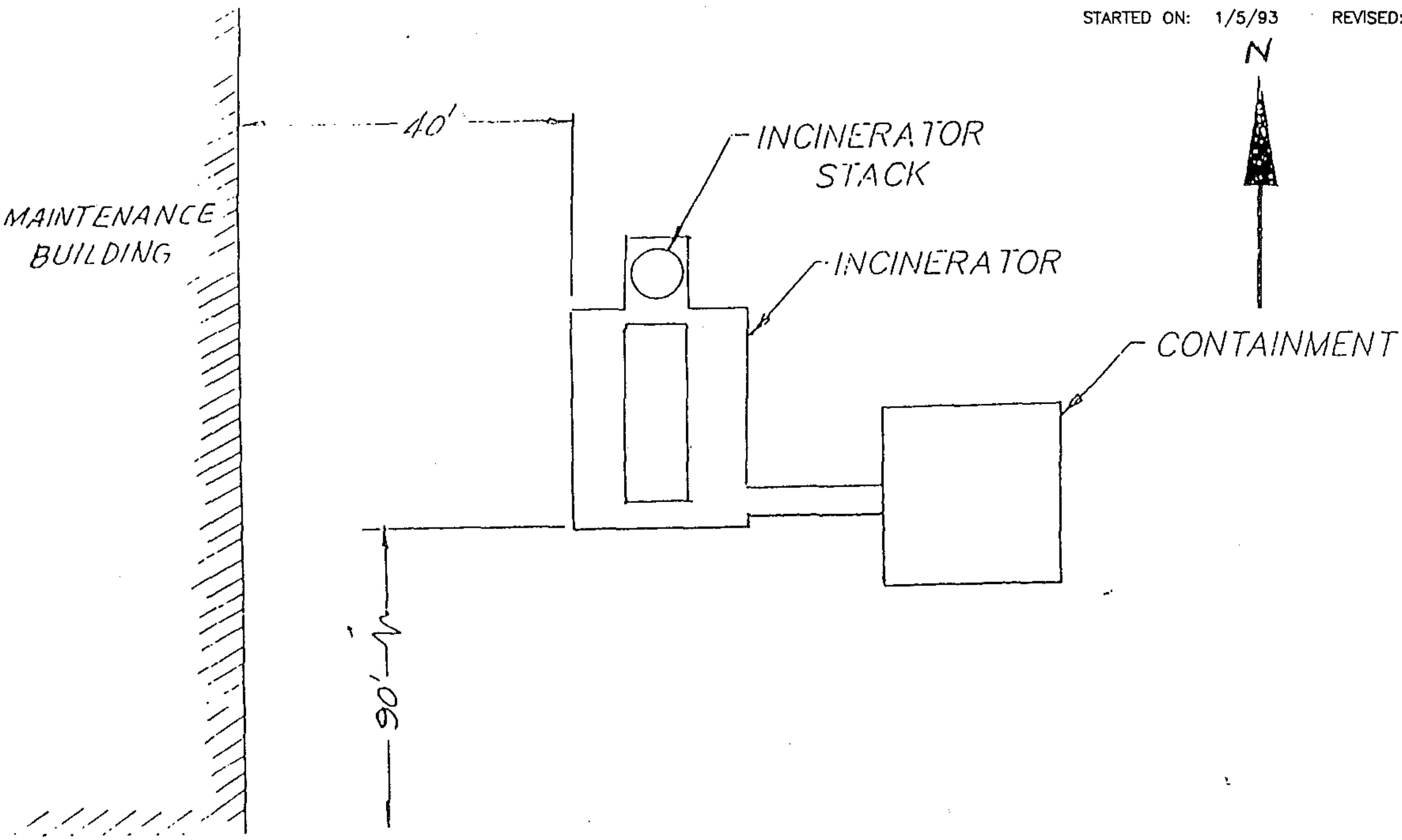


FIGURE 4.1

PPG INDUSTRIES, INC. CIRCLEVILLE, OHIO	FORMER LIQUID WASTE INCINERATOR (TO BE CLOSED)	
ICF KAISER ENGINEERS PITTSBURGH, PA	DATE: 1/5/93	DR.: D.MAJERNIK
	SCALE: 1"=20'	DWG. NO.: FIG4-1

HAZARDOUS WASTE AREA SPILL CONTAINMENT

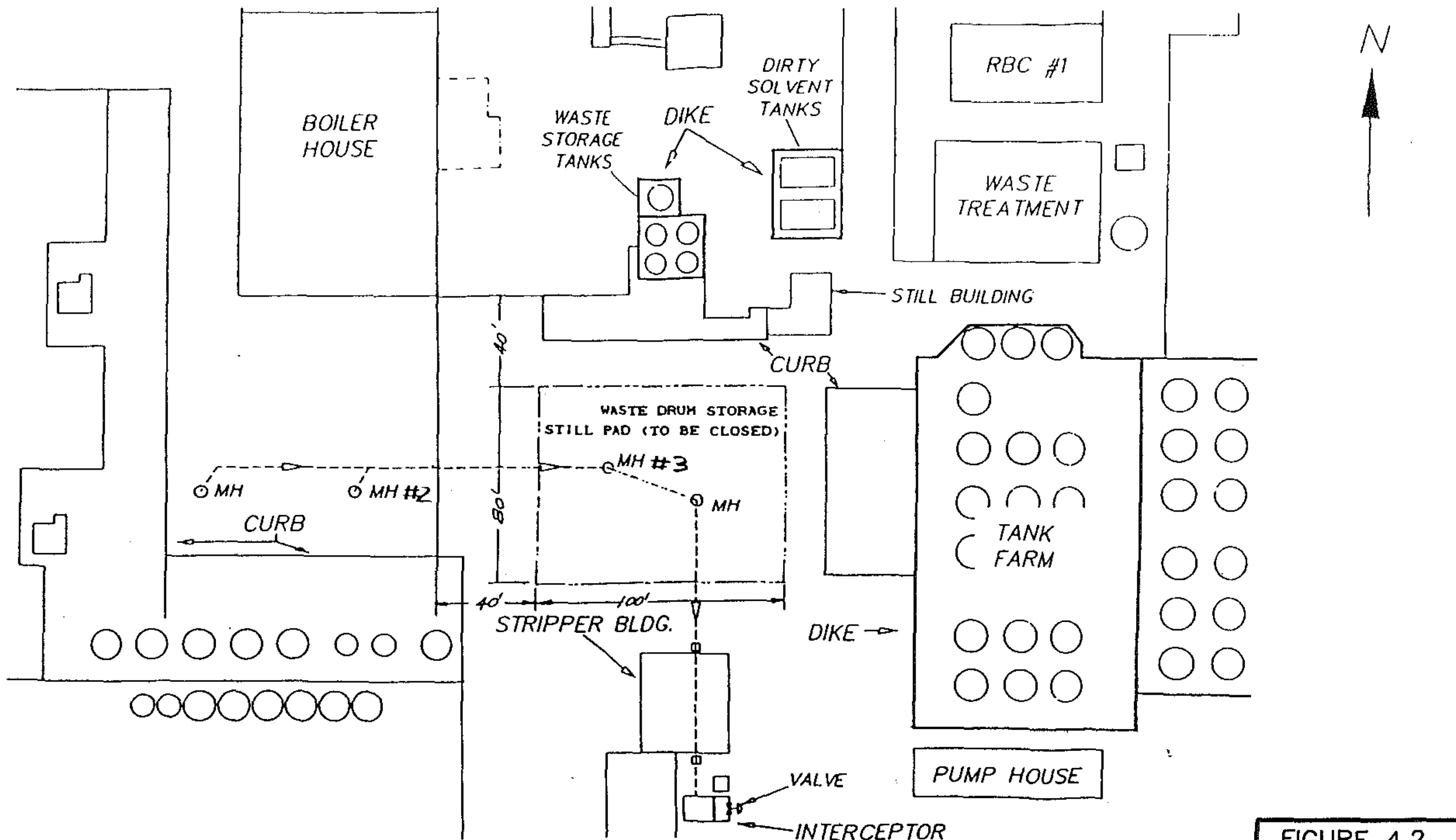


FIGURE 4.2

PPG INDUSTRIES, INC. CIRCLEVILLE, OHIO	WASTE DRUM STORAGE– STILL PAD (TO BE CLOSED)	
ICF KAISER ENGINEERS PITTSBURGH, PA	DATE: 1/6/93	DR.: D.MAJERNIK
	SCALE: 1"=40'	DWG. NO.: FIG4–2

JOB NO.: 0451200100 PLOT SCALE: 1=1

STARTED ON: 1/6/93 REVISED: 0/00/00

JOB NO.: 0451200100 PLOT SCALE: 1=1
STARTED ON: 1/6/93 REVISED: 0/00/00

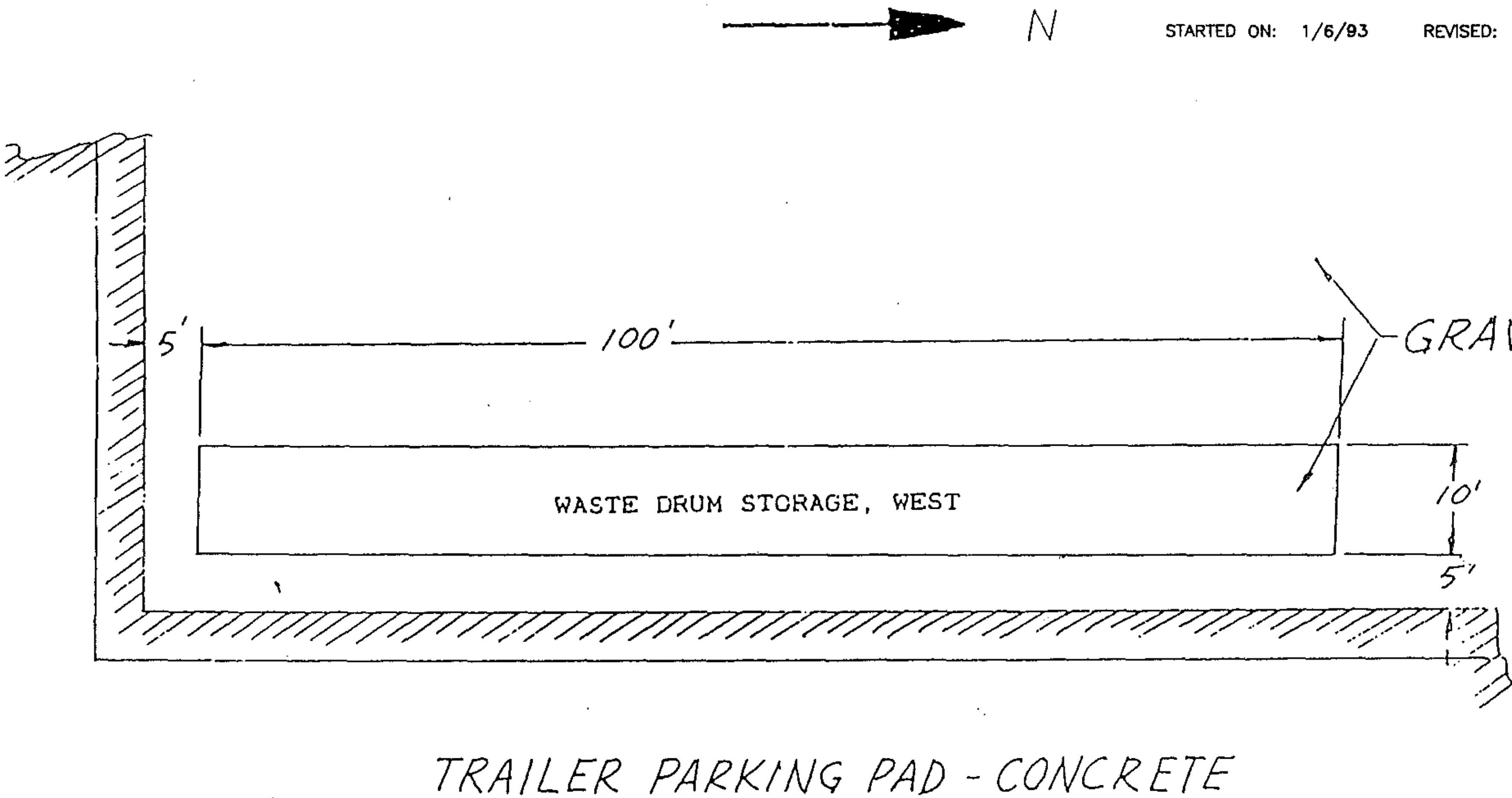


FIGURE 4.3

PPG INDUSTRIES, INC. CIRCLEVILLE, OHIO	WASTE DRUM STORAGE– WEST PAD (TO BE CLOSED)	
ICF KAISER ENGINEERS PITTSBURGH, PA	DATE: 1/6/93	DR.: D.MAJERNIK
	SCALE: 1"=15'	DWG. NO.: FIG4-3

JOB NO.: 0451200100 PLOT SCALE: 1=1

STARTED ON: 1/6/93 REVISED: 0/00/00

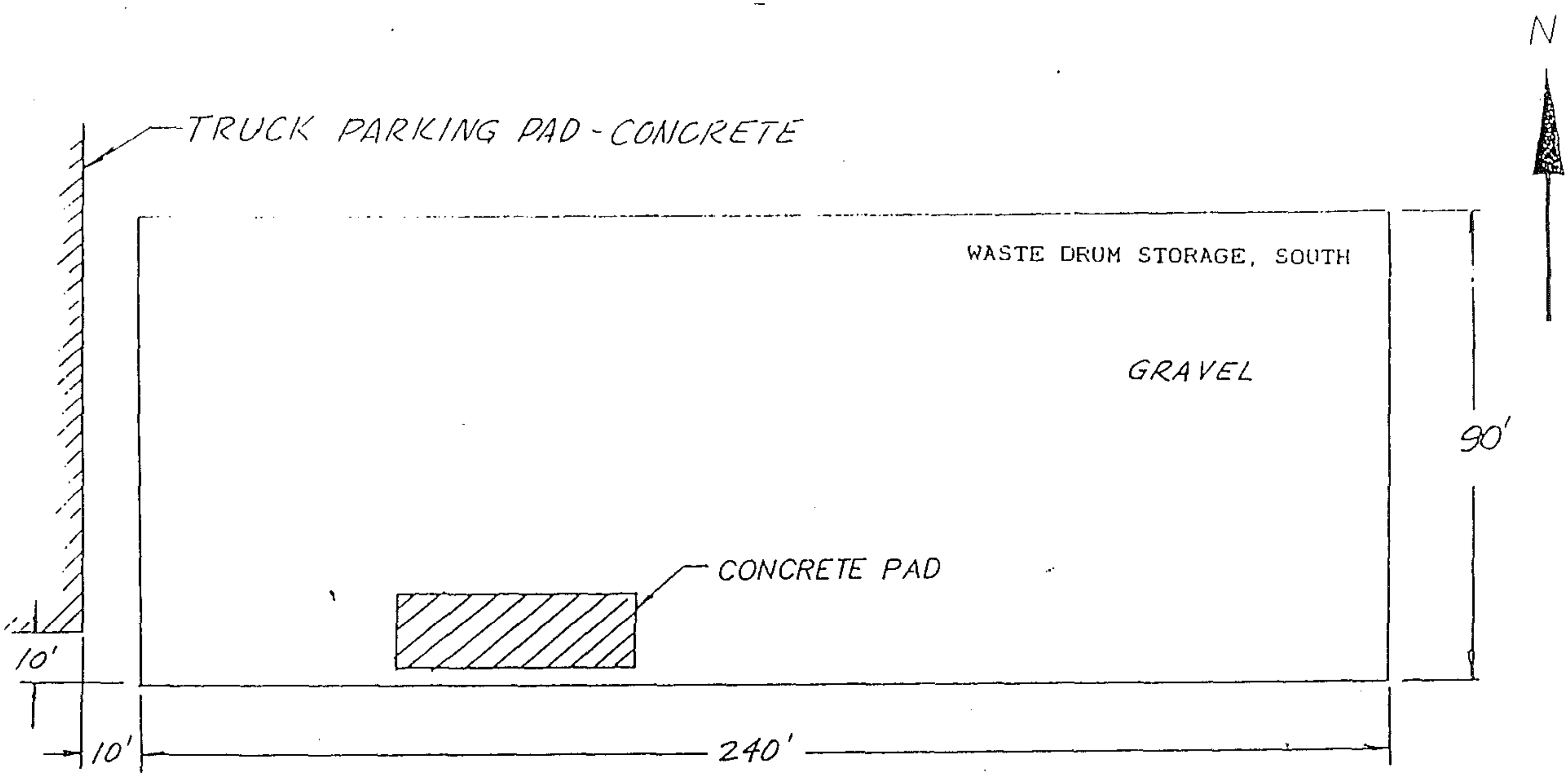


FIGURE 4.4

PPG INDUSTRIES, INC. CIRCLEVILLE, OHIO	WASTE DRUM STORAGE– SOUTH PAD (TO BE CLOSED)	
ICF KAISER ENGINEERS PITTSBURGH, PA	DATE: 1/6/93	DR.: D.MAJERNIK
	SCALE: 1"=30'	DWG. NO.: FIG4-4

5. LIST OF HAZARDOUS WASTES

A complete list of hazardous wastes and Appendix VIII hazardous constituents stored and/or treated at the waste management units closed under this Partial Closure Plan follows. This list also includes an estimate of the maximum inventory of waste in storage or treatment.

5.1 Liquid Waste Incinerator

D001 -	Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methyl isobutyl ketone, methanol, toluene or methyl ethyl ketone)
D001 - D002 D035	Aqueous Decanter Waste (aqueous phase byproduct from resin manufacturing process containing VOCs and organic acids)
F003 -	Still sludge including xylene, ethylbenzene, and methyl isobutyl ketone
F005 -	Still sludge including toluene and methyl ethyl ketone
	Maximum Incinerator Capacity - 5.5 tons/hour

5.2 Waste Drum Storage Area -- Still Pad

D001 -	Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methyl isobutyl ketone, methanol, toluene or methyl ethyl ketone)
F002 -	Spent methylene chloride
F003 -	Incinerator brick and residue generated by the incineration of F003 wastes
F005 -	Incinerator brick and residue generated by the incineration of F005 wastes
U009 -	Waste acrylonitrile
U223 -	Waste toluene diisocyanate
	Drums containing lab packs
	Maximum Inventory - 1000 drums

5.3 Waste Drums Storage Area -- West Pad

D001 - Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methyl isobutyl ketone, methanol, toluene or methyl ethyl ketone)

F002 Spent Methylene Chloride

Maximum Inventory - 200 drums

5.4 Waste Drum Storage -- South Pad

D001 - Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methyl isobutyl ketone, methanol, toluene or methyl ethyl ketone)

Maximum Inventory - 1500 drums

The previous Partial Closure Plan submitted to OEPA included methanol as a component of the F003 waste listing. However, the methanol managed at the facility was only associated with the Waste Resin Material (D001).

6. SCHEDULE FOR CLOSURE

Partial closure of the interim status hazardous waste management units at the site consisted of the following:

- Decontamination of Liquid Waste Incinerator equipment.
- Decontamination of the Still Pad concrete.
- Rinseate sampling and analysis to confirm successful decontamination of the incinerator equipment and Still Pad concrete, and to determine rinseate disposal requirements.
- Disposal of incinerator equipment.
- Removal and disposal of various concrete pads.
- Soil sampling and analysis to confirm that the remaining soils in the areas of the waste management units meet clean closure requirements.

Figure 6.1 shows the schedule in bar chart form, indicating the field activities that were performed during the time period April 1989 through November 1989. Since November of 1989, the following significant activities have occurred as the result of the continuing dialogue between PPG and Ohio EPA:

Date	Activity
05/11/90	PPG submits revised Partial Closure Plan.
07/25/90	Attorney General's office responds to resubmitted Plan. OEPA wants the Partial Closure Plan to reflect the work that has already been complete and for PPG to decide whether each unit will be clean closed or closed based on a risk assessment demonstration of clean closure.
01/14/91	PPG submits revised Partial Closure Plan that includes work completed to date and a risk assessment demonstration for clean closure of the South Drum Storage Pad, West Drum Storage Pad, and Former Liquid Incinerator area.
05/01/91	OEPA issues new closure guidance document.
06/28/91	OEPA provides comments on January 1991 Partial Closure Plan.
09/13/91	PPG submits response to OEPA issues raised in June 28, 1991 letter.

11/22/91	OEPA responds to 9/13/91 submittal by PPG.
11/26/91	PPG meets with OEPA to discuss each point in OEPA's November 22, 1991 letter.
01/03/92	Letter dated December 31, 1991 from OEPA which summarizes the status of negotiations based on the 11/26/91 meeting is transmitted to PPG. This OEPA letter summarized issues yet to be resolved.
04/14/92	PPG provides written response to OEPA's letter of 12/31/91. PPG's response includes documentation that PCB levels in the sampling results are unrelated to RCRA activities and that no additional sampling is necessary to define the extent of past releases.
05/08/92	Representatives of OEPA visit plant to look at areas covered by the Partial Closure Plan.
06/01/92	OEPA comments in writing on PPG's response of 4/14/92. OEPA accepts PPG's documentation that PCBs found as a result of closure sampling activities are unrelated to RCRA activities. OEPA requires that the full extent of contamination must be defined.
07/27/92	PPG responds in writing to OEPA's letter of 6/1/92. PPG proposes to perform additional soil sampling to move negotiations forward.
08/04/92	OEPA conducts site visit of plant.
08/07/92	PPG responds in writing to OEPA's site visit and proposes to take an additional sample from the former liquid incinerator area.
08/31/92	OEPA accepts the additional sampling proposed in PPG's letters of 7/27/92 and 8/7/92.
09/23/92	ICF Kaiser Engineers conducts additional sampling.
10/07/92	
10/13/92	Hearing date is set for February 8, 1993.

10/31/92	ICF Kaiser Engineers re-samples grids where samples from 9/23/92 exceeded their holding time for analysis.
12/11/92	PPG submits results of additional sampling program to OEPA.
01/08/93	PPG submits revised Partial Closure Plan to reflect all resolved issues.
01/19/93	*OEPA Central Office comments on the revised Partial Closure Plan dated January 7, 1993.*
01/21/93	*OEPA Central District Office comments on the revised Partial Closure Plan dated January 7, 1993.*
01/29/93	*PPG responds in writing to OEPA's comments of 1/19/93 and 1/21/93.*
02/02/93	*Hearing Examiner, counsel for PPG, and counsel for OEPA staff participate in a telephone conference call in which counsel represented that the parties had reached a settlement agreement. Additional time was requested to prepare a settlement agreement.*
02/05/93	*Attorney General's office responds to PPG response of 1/29/93. OEPA accepts PPG responses and requires that the Partial Closure Plan address all necessary sampling to define the vertical extent of contamiantion or provide for amending the Closure Plan to address closure in place.*
02/08/93	*Hearing Examiner orders filing of Settlement Agreement on or before March 1, 1993.*
02/19/93	*PPG submits revised Partial Closure Plan to incorporate comments in the letter dated 2/5/93 from the Attorney General's office.*

The only remaining schedule item is final certification by an independent registered Professional Engineer and PPG which will perform after acceptance of this revised plan by the Agency.

JOB NO.: 0451200100 PLOT SCALE: 1=1

STARTED ON: 1/5/93 REVISED: 0/00/00

	/9	9/16	9/23	9/30	10/7	10/14	10/21	10/28	11/4	11/11
CONTRACTOR MOBILIZATION										
INCINERATOR AREA										
INCINERATOR DEMOLITION AND DISP(										
OEPA WITNESSES INCINERATOR DEM(										
LINE FLUSHING										
RINSEATE SAMPLING AND ANALYSIS										
REMOVE AND DISPOSE OF INCINERA'										
REMOVE AND DISPOSE OF CONTAINN										
REMOVE AND DISPOSE OF PIPING										
OEPA NOTIFIED OF SOIL SAMPLING										
INCINERATOR AREA SOIL SAMPLING (										
STILL PAD AREA										
CLEAN STILL PAD										
STILL PAD RINSEATE SAMPLING AND										
MANHOLE SEDIMENT SAMPLING AND										
OEPA WITNESSES STILL PAD WORK										
REMOVE AND DISPOSE OF STILL PA(										
SOUTH STORAGE PAD AREA										
REMOVE CONCRETE CONSOLIDATION										
OEPA NOTIFIED OF SOIL SAMPLING										
SOIL SAMPLING AND ANALYSIS										
WEST PAD AREA										
OEPA NOTIFIED OF SOIL SAMPLING										
SOIL SAMPLING AND ANALYSIS										

FIGURE 6.1

PROJECT SCHEDULE
1989 PARTIAL CLOSURE ACTIVITIES

DATE: 1/5/93	DR.: D.MAJERNIK
SCALE: NONE	DWG. NO. TIMELINE.DWG

JOB NO.: 0451200100 PLOT SCALE: 1=1
STARTED ON: 1/5/93 REVISED: 0/00/00

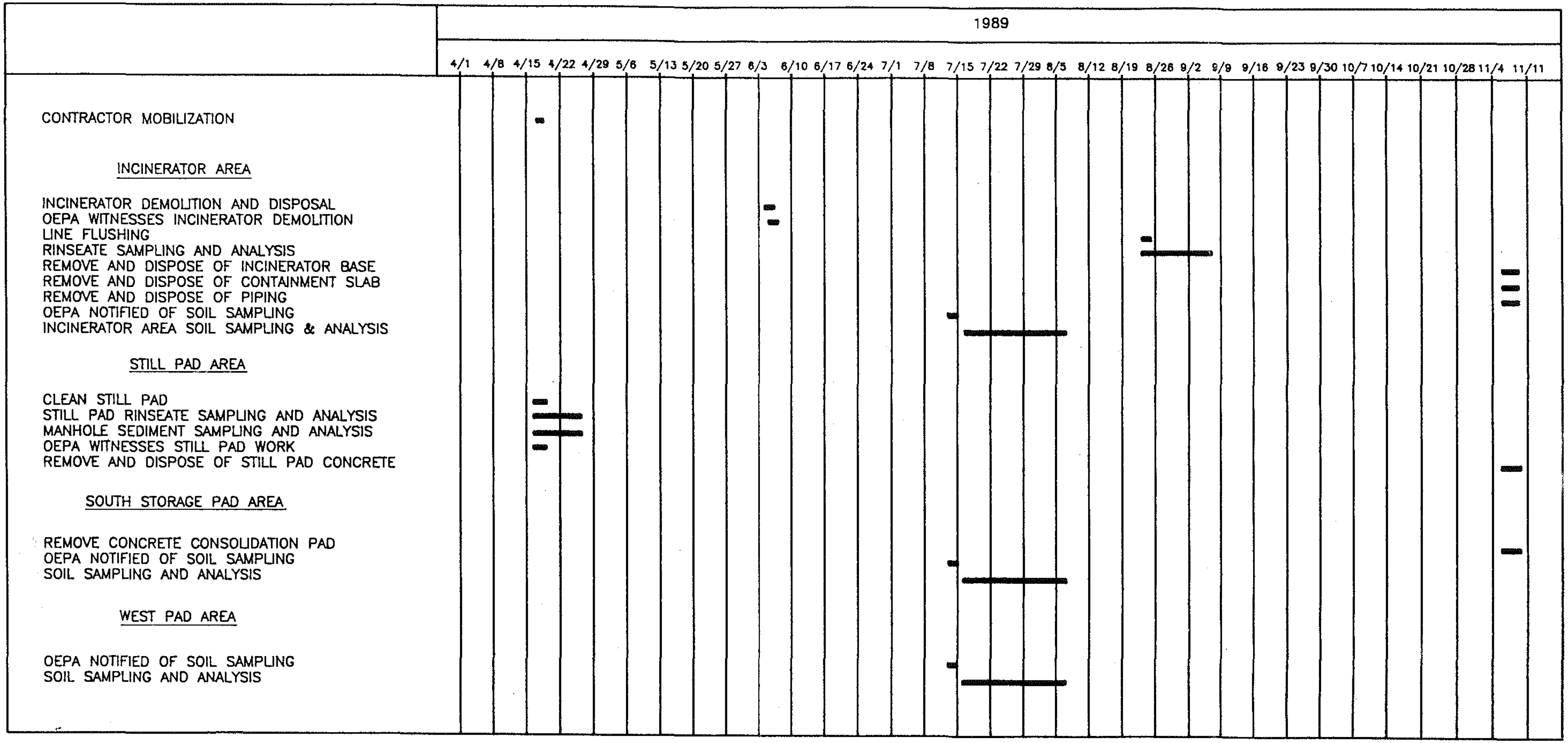


FIGURE 6.1

PPG INDUSTRIES, INC.
CIRCLEVILLE, OHIO

PROJECT SCHEDULE
1989 PARTIAL CLOSURE ACTIVITIES

ICF KAISER ENGINEERS
PITTSBURGH, PA

DATE: 1/5/93 DR.: D.MAJERNIK
SCALE: NONE DWG. NO. TIMELINE.DWG

7. AIR EMISSIONS

Appropriate engineering controls were used during the partial closure activities to minimize odors and dust emissions. Water spray was used as necessary to control fugitive dust emissions during incinerator decommissioning. Overspray from high pressure washing of the Still Pad was controlled by carefully directing the spray towards the center of the containment area and by plastic wrapped plywood barriers when working near the pad edges.

8. PERSONNEL SAFETY AND FIRE PREVENTION

All Partial Closure Work was performed in Level D protection. The personnel protective equipment consisted of coveralls, gloves, steel-toed boots, eye protection and hard hats. This level of protection provided adequate dermal and respiratory protection from the substances present in the closure areas and the work activities performed. Dust respirators (Level C respiratory protection) were used whenever personnel entered the incinerator or whenever conditions required them.

PPG plant safety rules were followed by clean-up and sampling personnel at all times during closure activities. These rules are attached as Attachment D. These safety rules address possible hazards to workers present at the plant, and describe specific fire prevention measures. Areas undergoing closure were isolated with yellow caution tape to limit access.

To prevent the spread of contamination during the 1989 closure activities, the following procedures were followed:

Prior to leaving the decontamination area, the coveralls were removed and discarded; residues from the boots or other outer protective clothing were scraped or rinsed. Personnel undergoing decontamination stood in containment areas to catch all rinseate and residues resulting from decontamination activities.

9. DECONTAMINATION EFFORTS

An independent registered Professional Engineer has certified that appropriate methods were used and that a minimum amount of residue remains based on the activities performed in 1989. The risk assessment as described in Section 10 of this Closure Plan confirms that the remaining residues do not present an unacceptable risk to human health. The results of analytical tests on the rinseates generated during decontamination efforts are included in Attachments A and B. Attachment A includes the results of all analyses performed during the closure under the direction of the independent registered Professional Engineer. Attachment B summarizes only the detected compounds. Additional soil sampling performed in 1992 at three of the interim status hazardous waste management units is described in Section 11.0 and the results included in Attachment C.

9.1 Incinerator

After shutdown and cooldown, all residue in the incinerator hearth, breech and stack were removed and put into drums. It was evident that decontamination was not feasible, due to difficulty in removing refractory material from metal parts. The incinerator hearth, breeching, stack, refractory, and ancillary equipment were dismantled and loaded into roll-off boxes or dump trailers and transported to Adams Center Landfill, a RCRA permitted secure landfill, located in Fort Wayne, Indiana. TCLP analyses for F003-F005 spent solvent wastes were performed to ensure compliance with land ban disposal restrictions. The results of this analysis are also included in Attachment B.

9.2 Incinerator Organic Waste Feed Lines

There were two (2) organic waste feed lines, each of which was approximately 120 feet long and 1-1/2 inches in diameter.

These lines were cleaned of organic residue by repeatedly flushing them with fifty gallons of cleaning solvent (the same solvent used by PPG to clean production equipment). The cleaning solvent was analyzed for percent total solids before and after each flush. When the "before" and "after" percent solids analysis of the cleaning solvent were within 0.5 percent of each other, solvent cleaning ceased. The spent solvent was sent to the on-site permitted hazardous waste incineration facility (ERU).

Following the solvent cleaning the lines were flushed three times with water to remove residual solvent. This water also was sent to the ERU. Detectable concentrations of solvents remained in the rinseate. It was decided to treat the pipe as a hazardous waste rather than attempt further decontamination.

The cleaned pipe was then taken down, cut into sections, and visually inspected for hardened residues. No residue was visible. The pipes were disposed of as a hazardous waste in the Adams Center Landfill.

9.3 Incinerator Aqueous Waste Feed Line

The aqueous waste feed line was about 100 feet long and one (1) inch in diameter.

The aqueous waste feed line was flushed three times with deionized water. The flushing water was sent to the ERU. Detectable concentrations of solvents remained in the rinseate. It was decided to treat the feed line as a hazardous waste rather than attempt further decontamination.

Once cleaned, the line was taken down, cut into sections, and inspected. No residue was visible. The pipes were disposed of as a hazardous waste in the Adams Center Landfill.

9.4 Incinerator Base, Spill Containment Pad and Drum Storage Pad (Still Pad)

After the incinerator equipment and residues were placed in secure containers as previously described, the incinerator base, spill containment pad and adjacent drum storage area were swept to remove any loose debris.

These areas then were scraped to remove any visible residues. All residues removed from the concrete surface were placed into DOT-approved 17-H drums.

No further cleaning was performed on the incinerator base and containment pad. These were removed and disposed of as a hazardous waste in the Adams Center Landfill. Although this material may have been considered "non-hazardous" under 40 CFR Part 261, it was disposed of as a hazardous waste.

The Still Pad was decontaminated with high pressure water. Rinseate was contained inside a foam dike which was installed at the perimeter. The dike material was used to provide a leak-proof containment area. During cleaning operations, all rinseate was collected using drum vacuums. The recovered water was transferred to DOT-approved 17-E drums. The final rinse was collected, placed into drums, and a composite sample collected using glass coliwassa tubes. The rinseate was analyzed for the entire Hazardous Substance List including the following F002, F003, and F005 substances:

Xylene
Ethylbenzene
Methyl Isobutyl Ketone

Methanol
Toluene
Methyl Ethyl Ketone
Methylene Chloride

The rinseate samples from this area were also analyzed for PCBs (polychlorinated biphenyls) and acrylonitrile. Toluene diisocyanate, also stored here, was not included in this analysis. This substance is reactive with water and cannot be quantified by standard analytical methods.

Of the above substances, only methylene chloride was found above detectable limits (169 parts per billion) in the final rinseate. Since no MCL or MCLG exists for methylene chloride, 1 mg/L is the clean standard for the rinseate. A library search for tentatively identified compounds also detected 84.1 mg/L of Butyl Cellosolve. This contaminant was most likely a result of using reconditioned 17-E Drums for rinseate collection. However, this compound is not a hazardous constituent as defined in 40 CFR Part 261. On this basis, the Still Pad was considered clean. All rinseate and foam dike material was incinerated on-site at the ERU.

As described in Section 12, the Still Pad was removed as part of PPG's East Yard PCB Remediation and Spill Containment Project. All concrete within the Still Pad area was removed and disposed of as a hazardous waste at the Adams Center Landfill. TCLP analyses for F003-F005 spent solvent wastes were performed to ensure compliance with land ban disposal restrictions. The results of these analyses are included in Attachment B. Although this material may have been considered "non-hazardous" under 40 CFR Part 261, it was disposed of as a hazardous waste.

10. CLEAN LEVELS FOR SOILS

10.1 Introduction

In order to demonstrate the clean closure of the Former Liquid Waste Incinerator, West Drum Storage Pad and the South Drum Storage Pad, a risk assessment was performed to determine whether or not a threat to human health exists in association with the residual chemicals originating in these three units. The risk assessment was conducted in accordance with the approaches and design required by OEPA's "Closure Plan Guidance Manual" (1991; with errata sheets), despite the fact that these approaches do not reflect anticipated site situations. This section is a brief summary of the supporting risk assessment for this partial closure. Details of the information presented here may be found in the risk assessment document included as Attachment E.

10.2 Background

The risk assessment was conducted in a manner consistent with the original National Academy of Sciences approach (1983), which recommends the four steps as follows: hazard identification (identification of chemicals of concern), which includes organization of unit investigation data and identification of chemicals of concern; dose-response assessment (toxicity assessment), which involves the determination of the relation between the magnitude of exposure (dose) and the probability of occurrence (response) of adverse health effects associated with the chemicals of concern; exposure assessment, which consists of identification of the receptors likely to be exposed to the chemicals and the extent of their exposure under defined exposure scenarios; and risk characterization, which is a description of the nature and the magnitude of non-cancer health risk and theoretical excess lifetime cancer risks, including attendant uncertainty, comparisons to typical risks encountered from other sources, and evaluation of the necessity for remedial action. Each step is addressed in greater detail below.

10.3 Chemical Selection

OEPA requires that every chemical attributable to and detected in each unit be incorporated into the risk assessment. In addition, the highest concentration of each detected chemical must also be included in the risk assessment for each unit. The applicable detected chemicals for each unit are presented in Table 10.1. These chemicals and the maximum concentrations were incorporated into the subsequent steps of the risk assessment.

10.4 PCB Exclusion

Polychlorinated biphenyls (PCBs) were detected in some of the soil samples collected from beneath the South Pad and Former Liquid Waste Incinerator areas; however, the presence of PCBs in these areas is not related to RCRA waste management activities and thus, PCBs were not included in the list of compounds addressed by the risk assessment. Attachment F presents PPG's documentation and certification that PCB levels recorded were not related to RCRA activities. This documentation was previously submitted to OEPA on April 14, 1992 and accepted by OEPA in their letter dated June 1, 1992.

Extensive PCB remediation has been conducted at the site by PPG. This remediation began in April of 1988 as a result of finding PCB contamination in the plant storm sewers. The source of this contamination was the hot oil Therminol System. Remediation followed the guidelines of the PCB Spill Cleanup Policy and applicable TSCA (Toxic Substances Control Act) requirements. The "action" level for soils tested as part of this remediation is 25 ppm as set forth in the cleanup policy for restricted area locations.

The storm sewer, including manholes in the Still Pad area, were included in the Phase III East Yard remediation project. Compounds present in the two open manholes in the Still Pad Area were clearly from sources other than the waste stored on the Still Pad Area. During remediation of the East Yard Area, PCB and VOC analysis were completed upstream, e.g., Manhole #2, of the Still Pad and showed elevated levels of PCBs and VOCs. Considering the source of PCB's (Therminol pump area) and VOC's (bulk product loading) it is clear these compounds were not related to hazardous waste storage at the Still Pad. These manholes were completely removed and replaced along with the rest of the contaminated storm sewers. All surface concrete in the East Yard area was also removed and replaced. A final report detailing remediation activities and sampling was submitted to OEPA in February 1990 and titled "East Yard Remediation, PPG Industries, February 1990, Project Number 88727". This contamination was and is being addressed by the Administrative Order of Consent signed between PPG and OEPA dated December 1989.

10.5 Dose-Response Assessment

To identify dose standards (benchmark values) for each of these chemicals, the USEPA Health Effects Summary Tables (HEAST) and Integrated Risk Information System (IRIS) were accessed and the information was incorporated into the risk assessment. Table 10.2 presents the benchmark values for each chemical of concern.

10.6 Exposure Assessment

OEPA requires a future unrestricted land use scenario for RCRA closure risk assessments. This scenario was incorporated into this risk assessment, for both an adult and a child, using factors as required in the OEPA "Closure Plan Guidance Manual". The exposure pathways required by OEPA were evaluated quantitatively, as follows: ingestion of chemicals in soil, dermal contact with chemicals in soil, inhalation of chemicals associated with unit-originated airborne particulate matter, ingestion of chemicals in water, inhalation of chemicals volatilizing during showering, dermal contact with chemicals in water, and inhalation of chemical volatilizing from soil. Where specific approaches were not identified by OEPA, appropriate calculations were incorporated, complete with explanations of factors, equations and full literature citations.

To document that there is no potential for constituent migration to groundwater, a total of four soil samples will be collected at a depth of 6"-12" below ground surface at Grid Location Numbers 24 and 45 at the Former Liquid Waste Incinerator and Grid Location Numbers 71 and 100 at the South Drum Storage Area and subjected to the TCLP leaching procedure. TCLP leachates produced will be analyzed for volatile organic constituents of concern (ethylbenzene, toluene, xylene and methylene chloride) using EPA SW 846 Method 8240.

10.7 Risk Characterization

The results of the risk assessment are presented in the risk characterization section of Attachment E. Noncancer hazard indices, summed for all chemicals and all exposure pathways, and theoretical excess lifetime cancer risks, summed for all chemicals and all pathways in each unit are presented here. OEPA requires that summed non-cancer hazard values be less than one, and that summed theoretical excess lifetime cancer risks be less than one in one million, or 1×10^{-6}. The data indicate that these values are within the acceptable limits for each unit. These data are presented in Table 10-3.

10.8 Uncertainty Analysis

The uncertainty analysis section of Attachment E qualitatively describes the likelihood that the approaches incorporated into this assessment result in underestimates or overestimates of the risk conclusions. Regulatory risk assessment in general, as it is currently practiced, is highly conservative and often focused on an absolute worst case scenario. The Closure Plan Guidance required by OEPA extends beyond that recommended even by the USEPA in the "Risk Assessment Guidance for Superfund" and implements approaches which would not be reproducible in an actual situation. Thus, the risks documented in this report are far in excess of those which would be anticipated to actually occur. Details on the basis for these conclusions are presented in the risk assessment document.

10.9 Conclusion

The results for the three units, the Former Incinerator, the South Pad and the West Pad, incorporating the selection of chemicals of concern, exposure assessment, dose-response assessment, and risk characterization approaches required by OEPA for RCRA closure, indicate that noncancer hazards and theoretical excess lifetime cancer risks are within the limits established in the Closure Plan Review Guidance Manual by the OEPA (1991). No subsequent evaluation or post-closure monitoring is recommended.

TABLE 10-1

CHEMICALS OF CONCERN

Area Description	Chemicals of Concern
Incinerator Area	*Xylene* *Ethylbenzene* *Methylene Chloride*
South Pad	Xylene Ethylbenzene Methylisobutyl Ketone (MIBK) Toluene Methylene Chloride
West Pad	Xylene Ethylbenzene Methanol Toluene

TABLE 10-2

BENCHMARK VALUES FOR CHEMICALS OF CONCERN

Chemical	Oral Reference Dose (RfD)	Inhalation Reference Dose	Oral Slope Factor	Inhalation Slope Factor
	(mg/kg-day)	(mg/kg-day)	$(mg/kg\text{-}day)^{-1}$	$(mg/kg\text{-}day)^{-1}$
Xylene	2.0 E+0	2.0 E+0[1]	NA[2]	NA
Ethylbenzene	1.0 E-1	2.9 E-1	NA	NA
MIBK	5.0 E-2	2.0 E-2	NA	NA
Methanol	5.0 E-1	5.0 E-1	NA	NA
Toluene	2.0 E-1	1.1 E-1	NA	NA
Methylene Chloride	6.0 E-2	*8.6 E-1*	7.5 E-3	1.7 E-3

[1] In absence of inhalation reference dose, the oral reference dose was used.

[2] NA - Not Applicable; Chemical not considered to be a potential carcinogen by the USEPA.

References: U.S. EPA, 1992a. IRIS (Integrated Risk Information System). U.S. Environmental Protection Agency, Washington, D.C.

U. S. EPA, 1992b. Health Effects Assessment Summary Tables, (HEAST, 1992).

U.S. EPA, 1991. Health Effects Assessment Summary Tables, (HEAST, 1991).

TABLE 10-3

SUMMARY TABLE FOR COMBINED HAZARD INDICES
AND THEORETICAL EXCESS LIFETIME CANCER RISKS

Receptor/Area	Combined Hazard Index	Theoretical Excess Lifetime Cancer Risks
Adult/Incinerator Area	6.26 E-03	8.83 E-07
Child/Incinerator Area	1.32 E-02	3.69 E-07
Adult/South Pad	1.43 E-02	6.62 E-07
Child/South Pad	3.22 E-02	2.77 E-07
Adult/West Pad	8.52 E-04	NA
Child/West Pad	1.91 E-03	NA

NA - No putative carcinogenic chemicals detected in this area

11. SOIL SAMPLING AND ANALYSIS

Sampling methods and equipment, as well as laboratory analytical methods, followed U.S. EPA's publication, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846). Sampling was performed by independent contractors, and the analysis was performed by an outside laboratory with an approved QA/QC plan for each parameter of interest. A copy of the laboratory's QA/QC qualifications was submitted to PPG. Actual QA/QC analysis is included in the analytical reports or available from the laboratory.

A summary of all 1989 soil sampling analytical results is included in Attachments A and B. Attachment A includes the results of all analyses performed during the Partial Closure activities under the direction of the independent registered Professional Engineer. Attachment B summarizes only the detected compounds.

In September 1992, PPG conducted additional sampling at the South Pad, West Pad and Former Liquid Waste Incinerator as agreed to in PPG's letters to OEPA dated July 27, 1992 and August 7, 1992. Results of this additional sampling effort are summarized in the Closure Plan Addendum presented in Attachment C. This addendum was submitted separately to OEPA on December 11, 1992.

The following Sections 11.1 through 11.4 summarize the soil sampling activities and results from the Partial Closure Activities performed in 1989. Attachment C describes the 1992 additional soil sampling program.

The results of these sampling efforts have established that no constituents of concern occur at unacceptable risk levels. However, detectable concentrations of methylene chloride were identified in 12"-24" samples from two locations at the Former Liquid Waste Incinerator (Grids 24 and 45) and one location at the South Drum Storage Area (Grid 100). To further define the occurrence of methylene chloride at depths below the 24" level from the units being closed, PPG will collect a minimum of two samples from these locations at 1 foot intervals below the 24 inch depth. The samples collected will be analyzed, along with appropriate QA/QC samples, for methylene chloride using EPA SW-846 method 8240. Additional sampling will be conducted if methylene chloride is detected in soil samples and the laboratory can document that the detection is not a result of laboratory contamination.

11.1 Incinerator Area

The soil around the Former Liquid Waste Incinerator was tested in 1989 for constituents listed below at points designated by the hatched areas of the Sampling Grid as shown in Figure 11.1. The representative sample points noted on all Sampling Grids in this Plan (Figures 11.1, 11.2 and 11.3) were developed using SW-846 protocol and a random number generator. If two points were adjacent, the next number was used. If concrete or a structure interfered with the sample location, the grid next to the location was used. Samples were collected according to EPA soil sampling and chain-of-custody protocol and analyzed using EPA SW-846 methods. A power auger was used to remove the top four to six inches. The loose soil was removed and a grab sample collected using a tongue depressor where necessary to loosen the soil. The samples were placed in clean glass 40 milliliter (ml) vials with Teflon septa.

The soil samples were analyzed for the complete Hazardous Substance List (HSL) volatiles according to SW-846 Method 8240. In addition, methanol, n-butanol and isobutanol were analyzed according to SW-846 Methods 5030 and 8015.

One composite soil sample made up of all eighteen soil samples from the area was analyzed for all dioxins and furans according to SW-846 Method 8280, including 2,3,7,8- TCDD (polychlorinated dibenzo dioxin), 2,3,7,8-TCDF (polychlorinated dibenzo furan), and PCBs (Polychlorinated Biphenyls) according to SW-846 Method 8080. Ignitability was not checked because there is no approved method of testing flashpoint of solids. The samples were not analyzed for heavy metals because metals were not used in manufacturing processes at the facility where the waste was generated.

It is unlikely that spills occurred in the incinerator area because of the closed piping system. The most likely source of leakage, if it occurred, would have been at the connection to the incinerator. No contaminated runoff occurred to the best of PPG's knowledge because of the containment pad around the incinerator. Samples were taken in the areas designated in Figure 11.1.

The results of the sampling are summarized in Attachments A, B and C. *Although no constituents have been detected at unacceptable risk levels, additional samples will be collected from Grid Locations 24 and 45 to further define the extent of vertical contamination so that the Incinerator Area can be considered clean closed.*

11.2 Still Pad

Sediment grab samples were obtained in 1989 from the bottom of the two grated cover manholes in this area. The sediment samples were analyzed for the complete Hazardous Substance List (HSL) volatiles according to SW-846 Method 8240. In addition; methanol, butanol, isobutanol, and butyl cellosolve were quantified according to SW-846 Methods 5030 and 8015. These samples also were analyzed for PCBs according to SW-846 Method 8080.

Still Pad decontamination rinseate sample results were below standards identified in OEPA's Closure Plan Review Guidance. Documentation exists to conclude that the presence of constituents of concern in subsurface soils are not related to RCRA management activities at the Still Pad. During Phase III of PPG's PCB remediation project, the Still Pad as well as contaminated storm sewers and manholes and the surface concrete in the Plant's East Yard were removed and replaced. A summary of analytical results from post remediation sampling is included in Table 11.1. To clarify the data presented in Table 11.1, Manhole #3 was within the area of the Still Pad and Manhole #2 was upgradient in the storm sewer system and closer to the source of VOC contamination (bulk product loading). A sketch of this portion of the East Yard showing the Still Pad and the location of the manholes and storm sewers is included in Figure 4.2. The Still Pad is considered cleaned closed and no further action is necessary.

11.3 South Drum Storage Area

Soil samples were taken in 1989 at points indicated by the hatched areas on the sampling grid shown in Figure 11.2, using methods previously described under Section 11.1. Analyses for HSL volatiles organics and alcohols were performed as described in Section 11.1.

Two composite soil samples made up of all 48 soil samples from the area were analyzed for PCBs according to SW-846 Method 8080. Soil was not tested for ignitability or heavy metals for the reasons described in Section 11.1.

The results of the sampling are summarized in Attachments A, B, and C. *Although no constituents have been detected at unacceptable risk levels, additional samples will be collected from Grid Location 100 to further define the extent of vertical contamination so that the South Drum Storage Area can be considered clean closed.*

11.4 West Drum Storage Pad

Soil samples were taken in 1989 at points indicated by the hatched areas on the sampling grid shown in Figure 11.3, using the methods previously described under Section 11.1. Analyses for HSL volatile organics and alcohols were performed as described in Section 11.1.

One composite soil sample made up of all nine soil samples from the area was analyzed for PCBs according to SW-846 Method 8080. Soil was not tested for ignitability or heavy metals for the reasons described in Section 11.1.

The results of the sampling are summarized in Attachments A, B and C. Since no constituents were detected at unacceptable risk levels, the West Pad is considered clean closed, and no further action is required.

TABLE 11.1

EAST YARD POT-REMEDIATION SAMPLING RESULTS
VOC AND PCB ANALYSIS
All Results in μg/kg

Volatiles	Manhole #2 Area	Manhole #3 Area	
	CV-89-0691	CV-89-0688	CV-89-0689
2-Butanone	920 J	490 J	800 J
Toluene	2100	580 U	800 U
Ethylbenzene	51000	2500	7000
Xylene	330000	24000	21000
4-methyl-2-pentanone	3700 U	1200 U	1600 U
PCB (A-1248)	2,100,000/1,500,000	590 U	3500

Letters refer to standard CLP qualifiers.

Note: Manhole #2 is located upgradient of the Still Pad.
Manhole #3 was within the area of the Still Pad.

JOB NO.: 0451200100 PLOT SCALE: 1=1

STARTED ON: 1/5/93 REVISED: 0/00/00

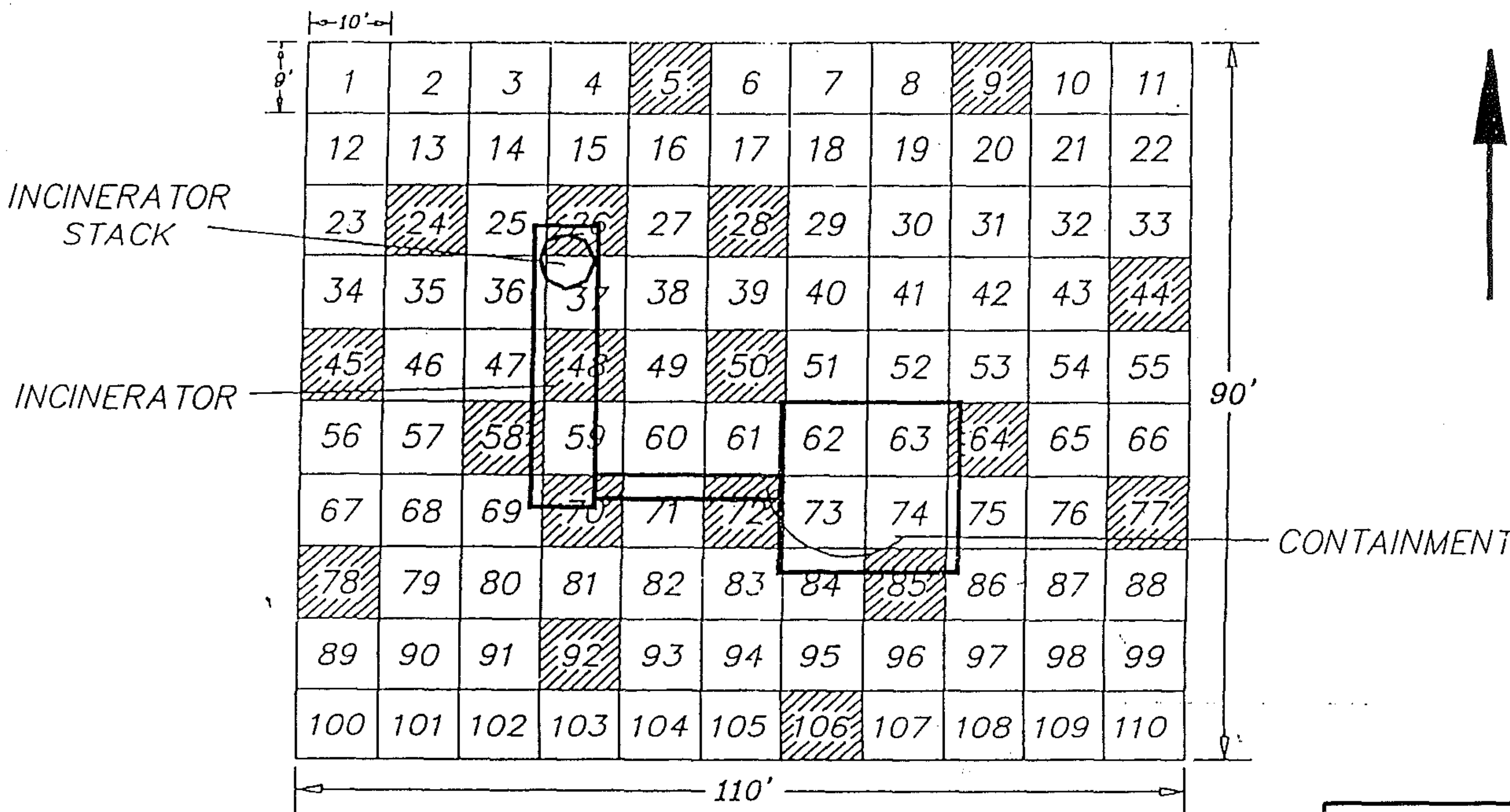
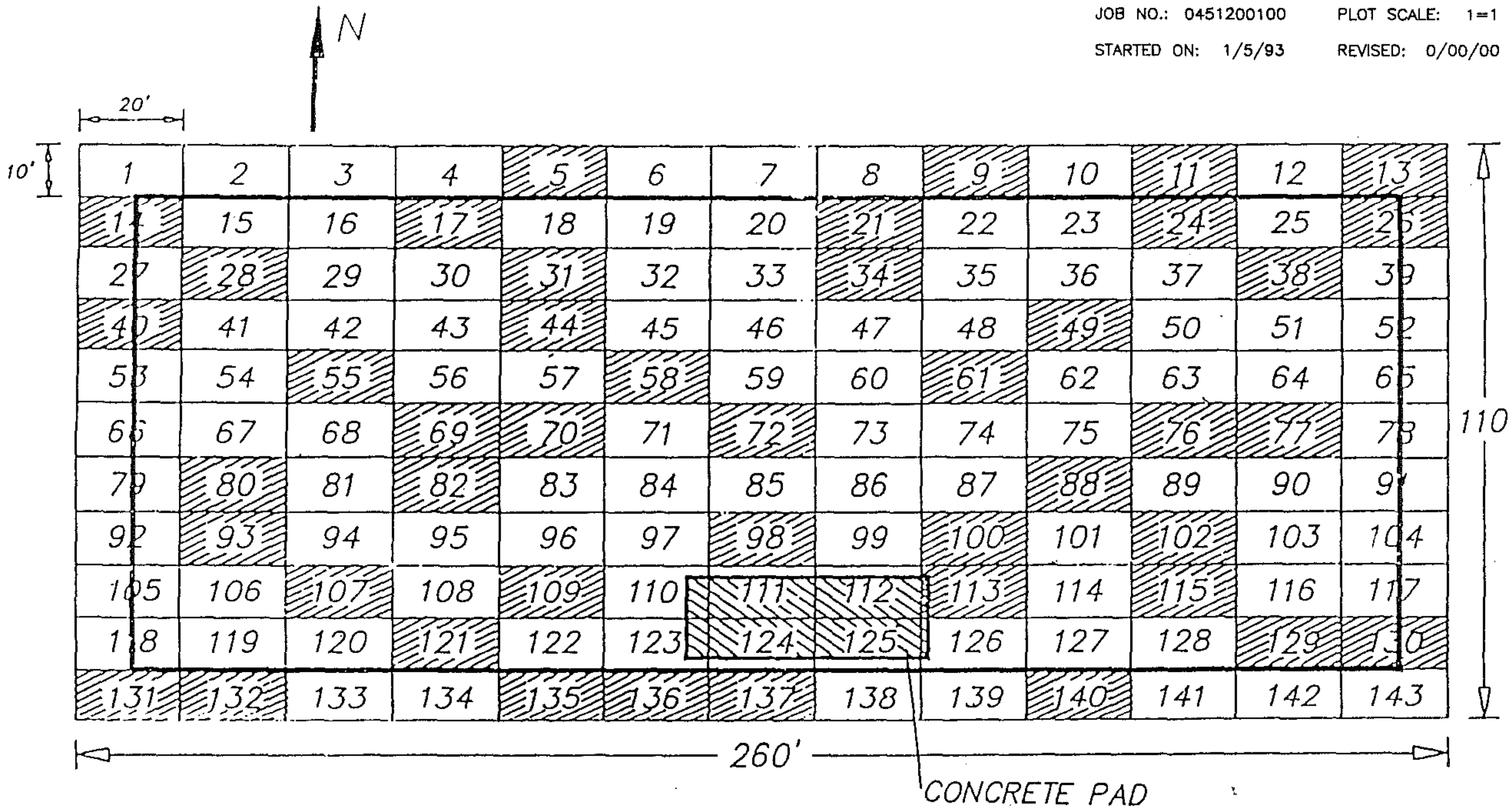


FIGURE 11.1

PPG INDUSTRIES, INC. CIRCLEVILLE, OHIO	SOIL SAMPLING GRID FOR FORMER LIQUID WASTE INCINERATOR
ICF KAISER ENGINEERS PITTSBURGH, PA	DATE: 1/5/93 | DR.: D.MAJERNIK SCALE: 1"=20' | DWG. NO.:FIG11-1

JOB NO.: 0451200100 PLOT SCALE: 1=1

STARTED ON: 1/5/93 REVISED: 0/00/00



NOTE: EACH SAMPLE WILL BE TAKEN AT THE CENTER OF THE DESIGNATED AREA.

FIGURE 11.2

PPG INDUSTRIES, INC. CIRCLEVILLE, OHIO	SOIL SAMPLING GRID FOR SOUTH PAD (90' X 240')
ICF KAISER ENGINEERS PITTSBURGH, PA	DATE: 1/5/93 — DR.: D.MAJERNIK SCALE: 1"=30' — DWG. NO.: FIG11-2

JOB NO.: 0451200100 PLOT SCALE: 1=1

STARTED ON: 1/5/93 REVISED: 0/00/00

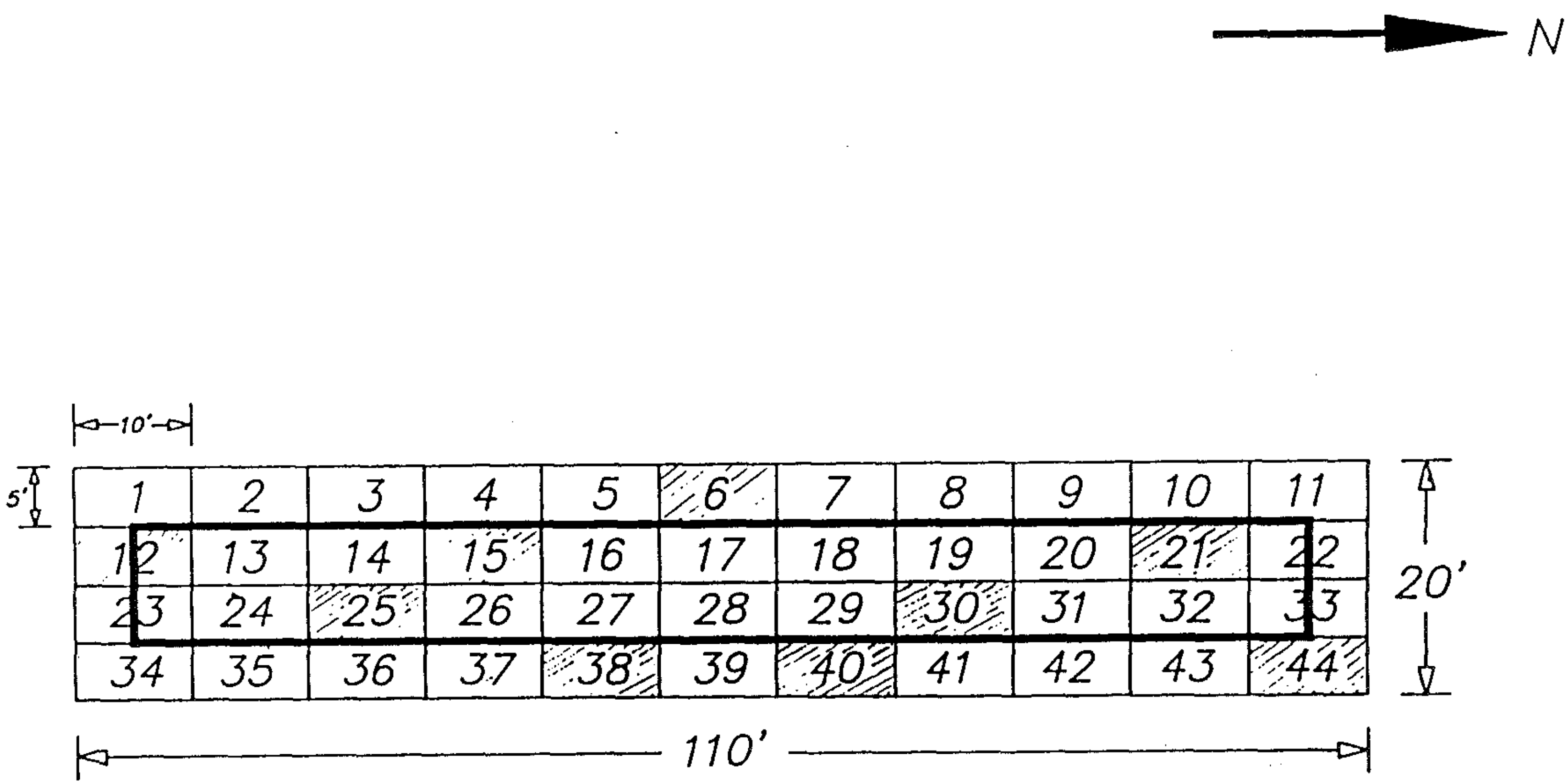


FIGURE 11.3

PPG INDUSTRIES, INC. CIRCLEVILLE, OHIO		SOIL SAMPLING GRID FOR WEST PAD (10' X 100')	
ICF KAISER ENGINEERS PITTSBURGH, PA		DATE: 1/5/93	DR.: D.MAJERNIK
		SCALE: 1"=15'	DWG. NO.: FIG11-3

12. DESCRIPTION OF REMOVAL EFFORTS

12.1 Incinerator Area

As described in Section 9, initial activities in 1989 were directed toward removal of residues from the Former Liquid Waste Incinerator, associated equipment, waste feed lines and the aqueous waste feed line. Due to the difficulty, expense, and subsequent waste generation, the incinerator and associated equipment was dismantled and treated as a hazardous waste. The incinerator foundation and containment pad concrete were also later removed. Although this concrete may have been considered "non-hazardous" under 40 CFR Part 261, it was disposed of as a hazardous waste. No soil was deliberately removed from the area, however, some soil was moved incidental to the concrete removal. These materials were loaded directly into rolloff boxes or dump trailers. No waste from this area was stockpiled on site. The materials were transported directly to the Adams Center Landfill in Fort Wayne, Indiana. A summary of wastes removed from this area is included in Table 12.1.

12.2 Still Pad

Results of rinseate analyses of the Still Pad, as described in Section 9, indicated that the concrete met the requirements for clean closure. However, subsequent activities in this area necessitated the removal of the Still Pad concrete. Although this concrete may have been considered "non-hazardous" under 40 CFR part 261, it was disposed of as a hazardous waste. The concrete was broken up and removed down to the underlying soil. The only soil removed was incidental to concrete removal as described in Section 12.1. The concrete was loaded directly onto rolloff boxes or dump trailers without stockpiling and transported to the Adams Center Landfill. A summary of wastes removed from this area is included in Table 12.1.

12.3 South Drum Storage Area

The concrete consolidation pad was broken up and removed down to the underlying soil. Although this concrete may have been considered "non-hazardous" under 40 CFR Part 261, it was disposed of as a hazardous waste. The only soil removed was incidental to concrete removal as described in Section 12.1. The waste was loaded directly into rolloff boxes or dump trailers without stockpiling and transported to the Adams Center Landfill. A summary of wastes removed from this area is included in Table 12.1.

12.4 West Drum Storage Pad

Initial sampling in 1989 was described in Section 11 indicated that the existing soils in the West Pad Drum Storage Area met the requirements for a clean closure. As a result, no material was removed from this area during closure activities.

TABLE 12.1

SUMMARY OF MATERIAL REMOVED

Area	Waste Type	Approximate Quantities Removed (lbs)	Manifest Numbers
Incinerator	Equipment, refractory	17,140	1484
		30,480	1485
		33,200	1486
Incinerator	Waste feed piping, foundation, containment pad	31,120	1672
		30,280	1673
Still Pad	Concrete, soil	32,040	1654
		28,900	1655
		31,100	1656
		37,320	1657
		40,540	1658
		28,620	1659
		34,500	1660
		26,800	1661
		37,500	1662
		51,860	1663
		26,920	1664
		28,900	1665
		29,400	1666
		29,470	1667
		40,500	1668
		40,180	1669
		28,020	1670
		29,600	1671
South Pad	Concrete, Consolidation Pad	29,120	1674

13. SPECIFIC CONSIDERATIONS

This section is reserved for details which are specific for landfill closures. The units covered under this Partial Closure are being clean closed per a risk assessment demonstration. Hence, no specific considerations are applicable.

14. DESCRIPTION OF EQUIPMENT CLEANING

The following describes the equipment cleaning efforts used in the vicinity of each of the interim status hazardous waste management units being closed. Residues generated by the scraping of equipment were handled as hazardous waste. Equipment was placed on a curbed, lined area and a pressure washer was used to remove any contamination. The decontamination areas were visqueen-lined, and large enough to ensure that no overspray was distributed outside the lined area. All recovered water was collected into a sump and then pumped into drums for sampling and analysis. Any rinse water which came in contact with listed hazardous wastes was managed as a listed waste. All decontamination pad plastic lining was disposed of in bulk or drummed and managed as a hazardous waste.

15. CERTIFICATION

PPG will provide certification that the former Liquid Waste Incinerator and three drum storage pads have been closed in accordance with the approved Partial Closure Plan. An independent registered Professional Engineer was present during critical stages of closure activities, such as incinerator demolition, line flushing and decontamination of the storage pads. The *Documentation* Report for these 1989 activities is included as Attachment H. This Engineer has *documented* that Partial Closure activities were performed in accordance with the applicable regulations and were consistent with the Ohio Environmental Protection Agency's Draft Closure Plan Review Guidance dated February 8, 1988. Upon approval of this Plan, which includes a risk assessment demonstration of clean closure, an independent registered Professional Engineer will certify that the Partial Closure is in accordance with the approved plan. PPG will certify closure in accordance with 40 CFR 265.115 and OAC 3745-66-15.

16. STATUS OF THE FACILITY AFTER CLOSURE

After the completion of partial closure activities, the Still Pad (see Figure 1.2) was converted to a satellite storage or "less-than-90-day-storage" area. The former Liquid Waste Incinerator in the manufacturing area and the other drum storage areas (the South Pad and West Pad) were permanently closed. The remainder of the hazardous waste management units at the PPG Circleville facility, which includes the ERU and five hazardous waste storage tanks at the resin plant, remain in operation.

ATTACHMENT A

Partial RCRA Closure - Analytical Summary

PPG-CIRCLEVILLE PARTIAL RCRA CLOSURE - ANALYTICAL RESULTS SUMMARY

Attachment A

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
CV-89-0221	--	7137	CV-89-0221	Still Pad	M.H. Sediment Sample	17-Apr-89	@ Right	BDL	mg/kg	1.0	Analysis for Methanol, Iso-butanol, Butanol & Butyl Callosolve
						17-Apr-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL except below
						17-Apr-89	Ethylbenzene	2.48	mg/kg	0.167	
						17-Apr-89	Meth. Chloride	0.228	mg/kg	0.167	
						17-Apr-89	Xylenes	0.335	mg/kg	0.167	
						17-Apr-89	@ Right	BDL	mg/kg	1.0	Analysis for 9 PCBs all BDL except below
						17-Apr-89	Aroclor 1248	6,700	mg/kg	1.0	
CV-89-0223	--	7137	CV-89-0222	Still Pad	Pipe Sediment Sample	17-Apr-89	@ Right	BDL	mg/kg	1.0	Analysis for Methanol, Iso-butanol, Butanol, & Butyl Callosolve
						17-Apr-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL except below
						17-Apr-89	MEK	15.3	mg/kg	4.00	
						17-Apr-89	Xylenes	167.5	mg/kg	4.00	
						17-Apr-89	@ Right	BDL	mg/kg	1.0	Analysis for 9 PCBs all BDL except below
						17-Apr-89	Aroclor 1248	41,400	mg/kg	1.0	
CV-89-0223	--	7137	CV-89-0223	Still Pad	3rd Rinse	17-Apr-89	@ Right	BDL	mg/kg	1.0	Analysis for Methanol, iso-butanol, & Butanol
						17-Apr-89	Butyl Cellosolve	85.4	mg/L	1.0	Initial run results shown, confirmed @ 84.1 mg/L
						17-Apr-89	@ Right	BDL	μg/L	Varies	Analysis for HSL Volatiles all BDL except below
						17-Apr-89	Meth. Chloride	169	μg/L	100	
						17-Apr-89	@ Right	BDL	μg/L	1.0	Analysis for a PCBs and BDL
CV-89-0224	--	7137	CV-89-0224	Still Pad	Rinsewater Source	17-Apr-89	@ Right	BDL	mg/L	1.0	Anlysis for iso-butanol, Butanol, & Butyl Cellosolve
						17-Apr-89	Methanol	6.95	mg/L	1.0	
						17-Apr-89	@ Right	BDL	μg/L	Varies	Analysis for HSL Volatiles all BDL except below
						17-Apr-89	Acetone	22.3	μg/L	10.0	
						17-Apr-89	Meth. Chloride	3.2	μg/L	2.00	
						17-Apr-89	@ Right	BDL	μg/L	1.0	Analyses for 9 PCBs all BDL
8-131	S-131	7137	JC5491	South Pad	Soil Sample	17-Jul-89	@ Right	BDL	mg/kg	0.965	Analysis for n-Butanol, isobutanol, and Methanol
						17-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL except below
						17-Jul-89	Toluene	2	mg/kg	0.3	
003	S-132	7137	JC5492	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.952	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volaties all BDL
004	S-135	7137	JC5493	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.972	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	0.972	Analysis for HSL Volatiles all BDL except below
						18-Jul-89	Xylenes	0.11	mg/kg	0.3	
005	S-136	7137	JC5494	South pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.950	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL except below
						18-Jul-89	Xylenes	0.6	mg/kg	0.3	
006	S-137	7137	JC5495	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.971	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
007	S-140	7137	JC5496	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.960	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
008	S-130	7137	JC5497	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.958	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
009	S-129	7137	JC5498	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.967	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL

PPG-CIRCLEVILLE PARTIAL RCRA CLOSURE - ANALYTICAL RESULTS SUMMARY

Attachment A

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
010	S-126	7137	JC5499	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.950	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Toluene	0.4	mg/kg	0.3	
011	S-124	7137	JC5500	South pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.952	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
012	S-121	7137	JC5501	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.952	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
013	S-107	7137	JC5502	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.971	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Meth. Chloride	0.3	mg/kg	0.3	
						18-Jul-89	Toluene	0.4	mg/kg	0.3	
014	S-109	7137	JC5503	South pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.992	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
015	S-109	7137	JC5530	Souh Pad	Soil Sample (Dupl. S-109)	18-Jul-89	@ Right	BDL	mg/kg	0.969	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Xylenes	0.6	mg/kg	0.3	
016	S-113	7137	HC5504	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.993	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
017	S-111	7137	JC5505	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.967	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
018	S-112	7137	JC5506	South Pad	Soil Sample	18-July-89	@ Right	BDL	mg/kg	0.977	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Toluene	0.4	mg/kg	0.3	
019	S-115	7137	JC5507	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.973	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
020	S-102	7137	JC5508	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.960	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
021	S-100	7137	JC5509	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.964	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Ethylbenzene	2	mg/kg	0.6	
						18-Jul-89	Meth. Chloride	0.3	mg/kg	0.3	
						18-Jul-89	Toluene	21	mg/kg	0.3	
						18-Jul-89	Xylenes	8	mg/kg	0.3	
022	S-96	7137	JC5510	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.991	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
023	S-93	7137	JC5511	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.988	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
024	S-80	7137	JC5512	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.964	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Toluene	0.5	mg/kg	0.3	

PPG-CIRCLEVILLE PARTIAL RCRA CLOSURE - ANALYTICAL RESULTS SUMMARY

Attachment A

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
025	S-88	7137	JC5513	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.999	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Meth. Chloride	0.5	mg/kg	0.3	
						18-Jul-89	Toluene	2	mg/kg	0.3	
026	S-82	7137	JC5514	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.957	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
C541	C541	7137	JC5541	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.25	Analysis for 7 PCBs all BDL, except below
						18-Jul-89	Arclor 1254	0.334	mg/kg	0.25	
027	S-77	7137	JC5515	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.966	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Meth. Chloride	0.3	mg/kg	0.3	
028	~~S-71~~ S 76	7137	JC5516	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.993	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Ethylbenzene	0.3	mg/kg	0.3	
						18-Jul-89	Toluene	17	mg/kg	0.3	
						18-Jul-89	Xylenes	0.16	mg/kg	0.3	
029	S-72	7137	JC5517	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	1.000	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Ethylbenzene	0.4	mg/kg	0.3	
						18-Jul-89	Meth. Chloride	0.3	mg/kg	0.3	
						18-Jul-89	Xylenes	0.18	mg/kg	0.3	
030	S-70	7137	JC5518	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.960	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
031	S-69	7137	JC5519	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.990	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Ethylbenzene	0.3	mg/kg	0.3	
						18-Jul-89	Meth. Chloride	3	mg/kg	0.3	
						18-Jul-89	Toluene	1	mg/kg	0.3	
						18-Jul-89	Xylenes	1.8	mg/kg	0.3	
032	S-65	7137	JC5520	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.974	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Meth. Chlorde	0.8	mg/kg	0.3	
033	S-65	7137	JC5540	South Pad	Soil Sample (Dupl. S-55)	18-Jul-89	@ Right	BDL	mg/kg	0.977	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Meth. Chloride	0.3	mg/kg	0.3	
034	S-58	7137	JC5521	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.962	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Meth. Chloride	0.3	mg/kg	0.3	
						18-Jul-89	Toluene	0.3	mg/kg	0.3	
035	S-61	7137	JC5522	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.976	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Toluene	0.3	mg/kg	0.3	
036	S-49	7137	JC5523	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.953	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
037	S-44	7137	JC5524	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.952 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
038	S-40	7137	JC5525	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Toluene	BDL BDL 0.4	mg/kg mg/kg mg/kg	0.964 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
039	S-26	7137	JC5526	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.961 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
040	S-34	7137	JC5527	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.961 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
041	S-31	7137	JC5526	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.965 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
042	S-38	7137	JC5529	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.970 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
043	S-26	7137	JC5530	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.966 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
044	S-24	7137	JC5531	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.953 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
045	S-21	7137	JC5532	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.960 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
046	S-17	7137	JC5533	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	1.000 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
047	S-5	7137	JC5534	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.979 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
048	S-14	7137	JC5535	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.999 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
049	S-9	7137	JC5536	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.996 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
050	S-11	7137	JC5537	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.993 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
051	S-13	7137	JC5538	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.983 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
C544	C544	7137	JC5542	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right Aroclor 1254	BDL 3.56	mg/kg mg/kg	0.25 0.25	Analysis for 7 PCBs and BDL, except below
052	--	7137	JC5552	General	Water Sample (Trip Blank)	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/L mg/L	1.000 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
053	W-44	7137	JC5543	West Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right Methanol @ Right Toluene	BDL 0.968 BDL 1.34	mg/kg mg/kg mg/kg mg/kg	0.988 0.968 Varies 0.196	Analysis for n-Butanol and Isobutanol Only detected alcohol in West Pad soils Analysis for HSL Volatiles, all BDL except below

PPG-CIRCLEVILLE PARTIAL RCRA CLOSURE - ANALYTICAL RESULTS SUMMARY

Attachment A

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
054	W-21	7137	JC5544	West pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.952 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
055	W-30	7137	JC5545	West Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.958 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
056	W-40	7137	JC5548	West Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.988 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
057	W-6	7137	JC5547	West Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Ethylbenzene Xylenes	BDL BDL 0.229 2.16	mg/kg mg/kg mg/kg mg/kg	0.964 Varies 0.186 0.186	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, excpet below
058	W-38	7137	JC5548	West Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Toluene	BDL BDL 0.621	mg/kg mg/kg mg/kg	0.973 Varies 0.190	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
059	W-15	7137	JC5549	West Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.977 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
060	W-26	7137	JC5550	West Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.944 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
061	W-12	7137	JC5551	West Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Xylenes	BDL BDL 0.454	mg/kg mg/kg mg/kg	0.979 Varies 0.199	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
C542	C542	7137	JC5554	West Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.25	Analysis for 7 PCBs, all BDL
062	W-12	7137	JC5553	West Pad	Soil Sample (Dupl. W-12)	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.996 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
063	I-9	7137	JC5556	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Rigut	BDL BDL	mg/kg mg/kg	0.975 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
064	I-44	7137	JC5556	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.929 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
065	I-77	7137	JC5557	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.958 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
066	I-64	7137	JC5558	Incinerator Area	soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Ethylbenzene Xylenes	BDL BDL 0.3 0.9	mg/kg mg/kg mg/kg mg/kg	0.967 Varies 0.3 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except BDL
067	I-85	7137	JC5559	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Ethylbenzene Xylenes	BDL BDL 0.6 0.7	mg/kg mg/kg mg/kg mg/kg	0.996 Varies 0.3 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
068	I-106	7137	JC5560	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.991 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
069	I-72	7137	JC5561	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.962 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL

PPG-CIRCLEVILLE PARTIAL RCRA CLOSURE - ANALYTICAL RESULTS SUMMARY

Attachment A

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
070	I-72	7137	JC5573	Incinerator Area	Soil Sample (Dupl. I-72)	18-Jul-89	@ Right	BDL	mg/kg	0.933	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Meth. Chloride	0.4	mg/kg	0.3	
						18-Jul-89	Xylenes	1.7	mg/kg	0.3	
071	I-92	7137	JC5562	Incinerator Area	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	1.000	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
072	I-70	7137	JC5563	Incinerator Area	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.944	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Meth. Chloride	0.3	mg/kg	0.3	
073	I-76	7137	JC5564	Incinerator Area	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.932	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
074	I-26	7137	JC5565	Incinerator Area	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.990	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
075	I-58	7137	JC5566	Incinerator Area	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.955	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
076	I-6	7137	JC5567	Incinerator Area	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.991	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
077	I-24	7137	JC5568	Incinerator Area	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.969	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Ethylbenzene	2	mg/kg	0.3	
						18-Jul-89	Meth. Chloride	4	mg/kg	0.3	
						18-Jul-89	Xylenes	4	mg/kg	0.3	
078	I-26	7137	JC5569	Incinerator Area	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.992	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Meth. Chloride	0.4	mg/kg	0.3	
079	I-48	7137	JC5670	Incinerator Area	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.978	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Xylenes	0.4	mg/kg	0.3	
080	I-45	7137	JC5571	Incinerator Area	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.945	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Ethylbenzene	0.6	mg/kg	0.3	
						18-Jul-89	2-Hexanone	3	mg/kg	0.6	
						18-Jul-89	Meth. Chloride	0.4	mg/kg	0.3	
						18-Jul-89	Xylenes	2	mg/kg	0.3	
081	I-60	7137	JC5572	Incinerator Area	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.931	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Meth. Chloride	0.4	mg/kg	0.3	
C543	C543	7137	JC5574	Incinerator Area	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.25	Analysis for 7 PCBs all BDL except below
						18-Jul-89	Aroclor 1254	1.79	mg/kg	0.25	
						18-Jul-89	@ Right	BDL	µg/kg	Varies	Analysis for 12 Cibenzo-P-Dioxins & Furene all BDL except below
						18-Jul-89	HpCDD	0.37	µg/kg	--	
						18-Jul-89	OCDD	1.91	µg/kg	--	
						18-Jul-89	2,37,a-TCDF	0.15	µg/kg	--	
						18-Jul-89	TCDF	0.22	µg/kg	--	

PPG-CIRCLEVILLE PARTIAL RCRA CLOSURE - ANALYTICAL RESULTS SUMMARY

Attachment A

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
085	--	7137	085	Incinerator	Final Phase Line 2	24-Aug-89	Methanol	93.1	mg/L	1.0	
						24-Aug-89	Iso-Butanol	10.1	mg/L	1.0	
						24-Aug-89	Butanol	86.3	mg/L	1.0	
						24-Aug-89	@ Right	BDL	µg/L	Varies	
						24-Aug-89	2-Butanone	39,000	µg/L	1,000	Analysis for HSL, Volatiles all BDL except below
						24-Aug-89	Ethylbenzene	36,000	µg/L	500	
						24-Aug-89	2-Hexanone	720,000	µg/L	1,000	
						24-Aug-89	Toluene	75,000	µg/L	500	
						24-Aug-89	Xylenes	240,000	µg/L	500	
086	--	7137	086	Incinerator	Distilled Rinse Water	24-Aug-89	@ Right	BDL	mg/L	1.0	Analysis for n-Butanol, isobutanol, and Methanol
						24-Aug-89	@ Right	BDL	µg/L	Varies	Analysis for HSL Volatiles all BDL, except below
						24-Aug-89	Toluene	170	µg/L	6	
087	--	7137	087	Incinerator	Service Water	24-Aug-89	@ Right	BDL	mg/L	1.0	Analysis for n-Butanol, isobutanol, and Methanol
						24-Aug-89	@ Right	BDL	µg/L	Varies	Analysis for HSL Volatiles all BDL
088	--	7137	088	Incinerator	Travel Blank	24-Aug-89	@ Right	BDL	µg/L	Varies	Analysis for HSL Volatiles all BDL
089	--	7137	089	Incinerator	Final Rinse Line 1	24-Aug-89	Methanol	16.5	mg/L	1.0	
						24-Aug-89	Iso-butanol	1.71	mg/L	1.0	
						24-Aug-89	Butanol	18.9	mg/L	1.0	
						24-Aug-89	@ Right	BDL	µg/L	Varies	
						24-Aug-89	2-Butanone	11,000	µg/L	1,000	Analysis for HSL Volatiles all BDL, except below
						24-Aug-89	Ethylbenzene	24,000	µg/L	1,000	
						24-Aug-89	2-Hexanone	300,000	µg/L	1,000	
						24-Aug-89	Toluene	33,000	µg/L	600	
						24-Aug-89	Xylenes	180,000	µg/L	600	
090	--	7137	090	Incinerator	Final Rinse Aqueous Waste	24-Aug-89	@ Right	BDL	mg/L	1.0	
						24-Aug-89	@ Right	BDL	µg/L	Varies	Analysis for n-Butanol, isobutanol, and Methanol
						24-Aug-89	Ethylbenzene	9,900	µg/L	500	Analysis for HSL Volatiles all BDL, except below
						24-Aug-89	2-Hexanone	1,900	µg/L	1,000	
						24-Aug-89	Toluene	15,000	µg/L	500	
						24-Aug-89	Xylenes	31,000	µg/L	500	

ATTACHMENT B

Partial RCRA Closure - Detected Compound Summary

PPG - CIRCLEVILLE PARTIAL RCRA CLOSURE - DETECTED COMPOUND SUMMARY

Attachment B

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
CV-89-0221	-	7137	CV-89-0221	STILL PAD	M.H. SEDIMENT SAMPLE	17-Apr-89	ETHYLBENZENE	2.48	mg/kg	0.167	
						17-Apr-89	METH. CHLORIDE	0.228	mg/kg	0.167	
						17-Apr-89	XYLENES	0.335	mg/kg	0.167	
						17-Apr-89	ARCOCLOR 1248	6,700	mg/kg	1.0	
CV-89-0222	-	7137	CV-89-0222	STILL PAD	PIPE SEDIMENT SAMPLE	17-Apr-89	MEK	15.3	mg/kg	4.00	
						17-Apr-89	XYLENES	167.5	mg/kg	4.00	
						17-Apr-89	AROCLOR 1248	41,400	mg/kg	1.0	
CV-89-0223	-	7137	CV-89-0223	STILL PAD	3rd RINSE	17-Apr-89	BUTYL CELLOSOLVE	85.4	mg/L	1.0	Initial run results shown, confirmed @ 84.1 mg/L
						17-Apr-89	METH. CHLORIDE	169	ug/L	100	
CV-89-0224	-	7137	CV-89-0224	STILL PAD	RINSEWATER SOURCE	17-Apr-89	METHANOL	6.95	mg/L	1.0	
						17-Apr-89	ACETONE	22.3	ug/L	10.0	
						17-Apr-89	METH. CHLORIDE	3.2	ug/L	2.0	
S-131	S-131	7137	S-131	SOUTH PAD	SOIL SAMPLE	17-Jul-89	TOLUENE	2	mg/kg	0.3	
004	S-135	7137	004	SOUTH PAD	SOIL SAMPLE	18-Jul-89	XYLENES	0.11	mg/kg	0.3	
005	S-136	7137	005	SOUTH PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.8	mg/kg	0.3	
010	S-126	7137	010	SOUTH PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.4	mg/kg	0.3	
013	S-107	7137	013	SOUTH PAD	SOIL SAMPLE	18-Jul-89	METH. CHLORIDE	0.3	mg/kg	0.3	
						18-Jul-89	TOLUENE	0.4	mg/kg	0.3	
015	S-109	7137	015	SOUTH PAD	SOIL SAMPLE (DUPL. S-109)	18-Jul-89	XYLENES	0.6	mg/kg	0.3	
018	S-112	7137	018	SOUTH PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.4	mg/kg	0.3	
021	S-100	7137	021	SOUTH PAD	SOIL SAMPLE	18-Jul-89	ETHYLBENZENE	2	mg/kg	0.6	
						18-Jul-89	METH. CHLORIDE	0.3	mg/kg	0.3	
						18-Jul-89	TOLUENE	21	mg/kg	0.3	
						18-Jul-89	XYLENES	8	mg/kg	0.3	
024	S-80	7137	024	SOUTH PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.5	mg/kg	0.3	
025	S-88	7137	025	SOUTH PAD	SOIL SAMPLE	18-Jul-89	METH. CHLORIDE	0.5	mg/kg	0.3	
						18-Jul-89	TOLUENE	2	mg/kg	0.3	
C541	C541	7137	JC6641	SOUTH PAD	SOIL SAMPLE	18-Jul-89	AROCLOR 1254	0.334	mg/kg	0.25	
027	S-77	7137	027	SOUTH PAD	SOIL SAMPLE	18-Jul-89	METH. CHLORIDE	0.3	mg/kg	0.3	
028	S-71	7137	028	SOUTH PAD	SOIL SAMPLE	18-Jul-89	ETHYLBENZENE	0.3	mg/kg	0.3	
						18-Jul-89	TOLUENE	17	mg/kg	0.3	
						18-Jul-89	XYLENES	0.16	mg/kg	0.3	
029	S-72	7137	029	SOUTH PAD	SOIL SAMPLE	18-Jul-89	ETHYLBENZENE	0.4	mg/kg	0.3	
						18-Jul-89	METH. CHLORIDE	0.3	mg/kg	0.3	
						18-Jul-89	XYLENES	0.18	mg/kg	0.3	
031	S-69	7137	031	SOUTH PAD	SOIL SAMPLE	18-Jul-89	ETHYLBENZENE	0.3	mg/kg	0.3	
						18-Jul-89	METH. CHLORIDE	3	mg/kg	0.3	
						18-Jul-89	TOLUENE	1	mg/kg	0.3	
						18-Jul-89	XYLENES	1.8	mg/kg	0.3	

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
032	S-55	7137	032	SOUTH PAD	SOIL SAMPLE	18-Jul-89	METH. CHLORIDE	0.8	mg/kg	0.3	
033	S-55	7137	033	SOUTH PAD	SOIL SAMPLE (DUPL. S-55)	18-Jul-89	METH. CHLORIDE	0.3	mg/kg	0.3	
034	S-58	7137	034	SOUTH PAD	SOIL SAMPLE	18-Jul-89 18-Jul-89	METH. CHLORIDE TOLUENE	0.3 0.3	mg/kg mg/kg	0.3 0.3	
035	S-61	7137	035	SOUTH PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.3	mg/kg	0.3	
038	S-40	7137	038	SOUTH PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.4	mg/kg	0.3	
C544	C544	7137	JC5542	SOUTH PAD	SOIL SAMPLE	18-Jul-89	AROCLOR 1254	3.56	mg/kg	0.25	
053	W-44	7137	JC5543	WEST PAD	SOIL SAMPLE	18-Jul-89 18-Jul-89	METHANOL TOLUENE	0.968 1.34	mg/kg mg/kg	0.968 0.198	Only detected alcohol in West Pad soils
057	W-6	7137	JC5547	WEST PAD	SOIL SAMPLE	18-Jul-89 18-Jul-89	ETHYLBENZENE XYLENES	0.229 2.16	mg/kg mg/kg	0.186 0.186	
058	W-38	7137	JC5548	WEST PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.621	mg/kg	0.190	
061	W-12	7137	JC5551	WEST PAD	SOIL SAMPLE	18-Jul-89	XYLENES	0.454	mg/kg	0.199	
066	I-64	7137	066	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89 18-Jul-89	ETHYLBENZENE XYLENES	0.3 0.9	mg/kg mg/kg	0.3 0.3	
067	I-85	7137	067	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89 18-Jul-89	ETHYLBENZENE XYLENES	0.6 0.7	mg/kg mg/kg	0.3 0.3	
070	I-72	7137	070	INCINERATOR AREA	SOIL SAMPLE (DUPL. I-72)	18-Jul-89 18-Jul-89	METH. CHLORIDE XYLENES	0.4 1.7	mg/kg mg/kg	0.3 0.3	
072	I-70	7137	072	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89	METH. CHLORIDE	0.3	mg/kg	0.3	
077	I-24	7137	077	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89 18-Jul-89 18-Jul-89	ETHYLBENZENE METH. CHLORIDE XYLENES	2 4 4	mg/kg mg/kg mg/kg	0.3 0.3 0.3	
078	I-28	7137	078	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89	METH. CHLORIDE	0.3	mg/kg	0.3	
079	I-48	7137	079	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89	XYLENES	0.4	mg/kg	0.3	
080	I-45	7137	080	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	ETHYLBENZENE 2-HEXANONE METH. CHLORIDE XYLENES	0.6 3 0.4 2	mg/kg mg/kg mg/kg mg/kg	0.3 0.6 0.3 0.3	
081	I-50	7137	081	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89	METH. CHLORIDE	0.4	mg/kg	0.3	
C543	C543	7137	JC5574	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	AROCLOR 1254 HpCDD OCDD 2,3,7,8-TCDF TCDF	1.79 0.37 1.91 0.15 0.22	mg/kg ug/kg ug/kg ug/kg ug/kg	0.25 - - - -	

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
085	-	7137	085	INCINERATOR	FINAL RINSE LINE 2	24-Aug-89	METHANOL	93.1	mg/L	1.0	
						24-Aug-89	ISO-BUTANOL	10.1	mg/L	1.0	
						24-Aug-89	BUTANOL	85.3	Mg/L	1.0	
						24-Aug-89	2-BUTANONE	39,000	ug/L	1,000	
						24-Aug-89	ETHYLBENZENE	36,000	ug/L	500	
						24-Aug-89	2-HEXANONE	720,000	ug/L	1,000	
						24-Aug-89	TOLUENE	75,000	ug/L	500	
						24-Aug-89	XYLENES	240,000	ug/L	500	
086	-	7137	086	INCINERATOR	DISTILLED RINSE WATER	24-Aug-89	TOLUENE	170	ug/L	5	
089	-	7137	089	INCINERATOR	FINAL RINSE LINE 1	24-Aug-89	METHANOL	16.5	mg/L	1.0	
						24-Aug-89	ISO-BUTANOL	1.71	mg/L	1.0	
						24-Aug-89	BUTANOL	18.9	mg/L	1.0	
						24-Aug-89	2-BUTANONE	11,000	ug/L	1,000	
						24-Aug-89	ETHYLBENZENE	24,000	ug/L	1,000	
						24-Aug-89	2-HEXANONE	300,000	ug/L	1,000	
						24-Aug-89	TOLUENE	33,000	ug/L	500	
						24-Aug-89	XYLENES	180,000	ug/L	500	
090	-	7137	090	INCINERATOR	FINAL RINSE AQUEOUS WASTE	24-Aug-89	ETHYLBENZENE	9,900	ug/L	500	
						24-Aug-89	2-HEXANONE	1,900	ug/L	1,000	
						24-Aug-89	TOLUENE	15,000	ug/L	500	
						24-Aug-89	XYLENES	31,000	ug/L	500	
CV-89-1503	-	9-21-89	12372-89	STILL PAD	COMPOSITE CONCRETE & SOIL	18-Sep-89	@RIGHT	BDL	mg/L	VARIES	TCLP Analysis for 8 RCRA metals all BDL except below
						18-Sep-89	BARIUM	1.1	mg/L	UNKNOWN	
CV-89-1503	-	9-21-89	9697	STILL PAD	COMPOSITE CONCRETE & SOIL	18-Sep-89	@RIGHT	BDL	ug/L	VARIES	TCLP Analysis for 25 RCRA organics all BDL

ATTACHMENT C

Addendum to Sampling Activities
Associated with Partial Closure Plan

ADDENDUM TO SAMPLING ACTIVITIES ASSOCIATED WITH PARTIAL CLOSURE PLAN

FOR

PPG INDUSTRIES, INC. CIRCLEVILLE, OHIO

Prepared for:

PPG INDUSTRIES, INC.
Coatings and Resins
Circleville, Ohio

Prepared by:

ICF KAISER ENGINEERS, INC.
Four Gateway Center
Pittsburgh, Pennsylvania 15222

December, 1992

PARTIAL CLOSURE PLAN
TABLE OF CONTENTS

List of Tables

List of Figures

1.0 ADDENDUM INTRODUCTION

On January 14, 1991, PPG Industries, Inc. submitted a revised partial closure plan for four interim status RCRA TSD units identified as the Still Pad Drum Storage Area, West Drum Storage Pad, the South Drum Storage Pad, and the Former Liquid Waste Incinerator. Since the submittal of the revised plan, PPG and OEPA have engaged in several rounds of negotiations centering around the definition of the full extent of contamination attributed to three of these RCRA units, (West Drum Storage Pad, South Drum Storage Pad, and the Liquid Waste Incinerator).

This addendum presents a description of the field sampling conducted as a result of negotiations with OEPA, the results of sample analysis and a brief discussion of the results.

2.0 SAMPLING AND ANALYSIS PLAN

2.1 INTRODUCTION

The purpose of this section is to describe the sampling methodology and analysis associated with the collection of soil samples offered in response to OEPA comments as presented in PPG's letters dated July 27, 1992, and August 7, 1992. The Proposed Sampling Program was subsequently approved by the Ohio EPA on August 31, 1992. Appendix A includes copies of the correspondence.

2.2 FIELD SAMPLING ACTIVITIES

2.2.1 Re-establishment of Grids

On September 21 and 22, 1992 a two man sampling crew re-established the sampling grid system originally associated with the closure activities of the Former Liquid Incinerator Pad, the West Pad Drum Storage Area, and the South Pad Drum Storage Area. As part of this activity, additional grids, as concurred with OEPA, were established to further define the possible extent of contamination.

Due to a missed holding time for some of the samples obtained from grids at the 12-24 inch interval on September 21-22, 1992, additional sampling was performed on October 31, 1992. Five additional soil samples and one field blank were obtained at that time. The location and sampling grids are presented below.

■ Former Liquid Incinerator Pad	Grids 24 and 45
■ South Pad Drum Storage	Grid 100
■ West Pad Drum Storage	Grids 6 and 44

All sampling was performed following the same methodology used in prior sampling events. No variation of methods occurred.

2.2.1.1 Former Liquid Incinerator Area

Sampling Grids 24, 34-36, 45-47 and 56-58 were re-established. Sampling grids 111-115 were added to the western boundary of the existing grid system. As part of the Former Liquid Incinerator Pad grid re-establishment procedure, the location of the former incinerator stack was verified from photos and previous work performed by plant personnel. Figure 2-1 illustrates the sample grid.

2.2.1.2 West Pad Drum Storage

Along with the re-establishment of the former grid system, 16 new sampling grids were added. Grids 45-60 were added to the western and northern boundaries of the existing grid system. Figure 2-2 illustrates the sampling grid.

JOB NO.: 0451200100 PLOT SCALE: 1=20
STARTED ON: 11/10/92 REVISED: 12/04/92

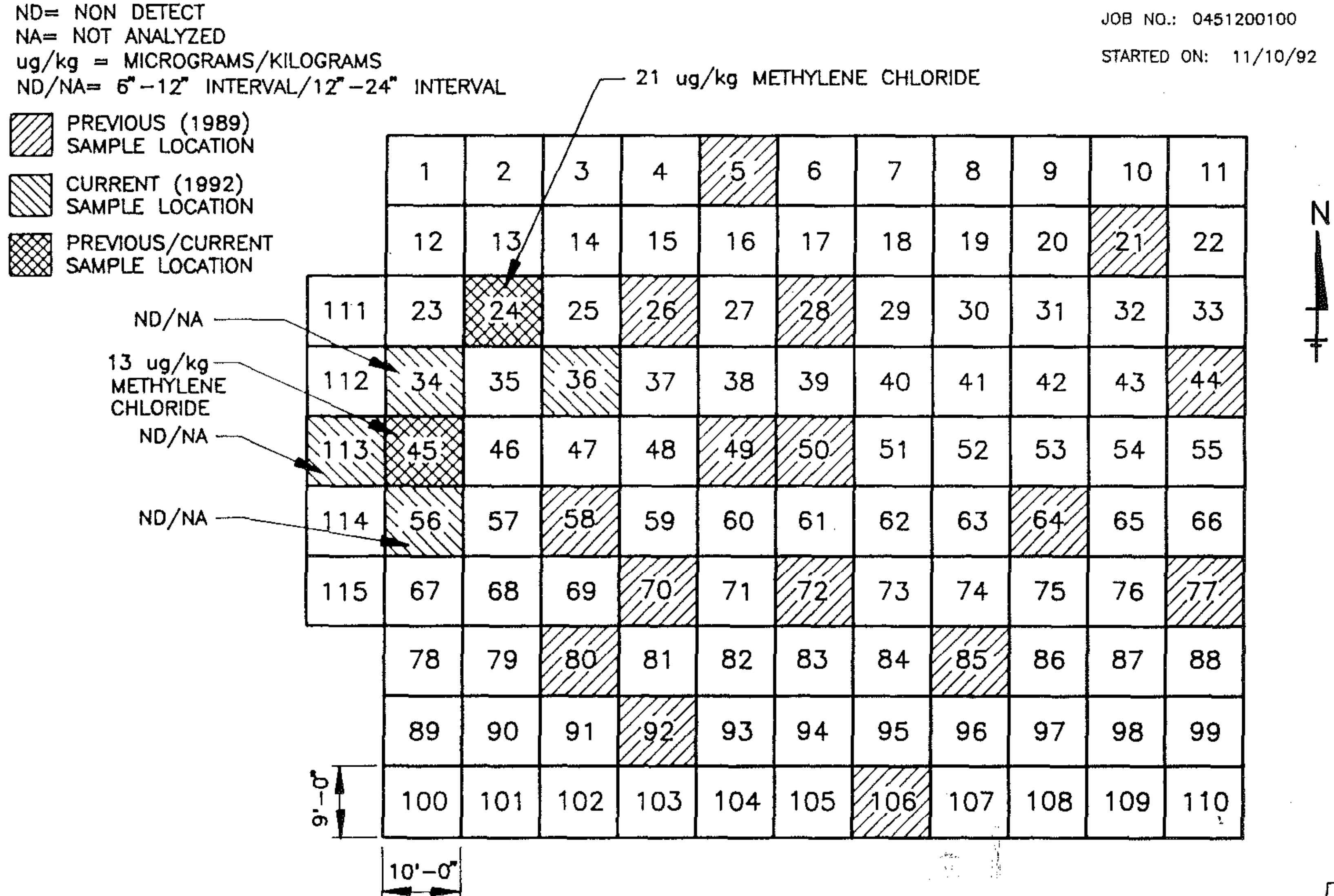


FIGURE 2-1

PPG INDUSTRIES, INC. COATINGS & RESINS DIVISION, CIRCLEVILLE, OHIO	SOIL SAMPLING GRID INCINERATOR AREA	
ICF KAISER ENGINEERS PITTSBURGH, PA	DATE: 11/10/92	DR.: D.MAJERNIK
	SCALE: 1"=20'	DWG. NO.: FIG2-1

ND= NON DETECT
NA= NOT ANALYZED
ug/kg = MICROGRAM/KILOGRAM
ND/NA= 6"–12" INTERVAL/12"–24" INTERVAL

PREVIOUS (1989) SAMPLE LOCATION

CURRENT (1992) SAMPLE LOCATION

PREVIOUS/CURRENT SAMPLE LOCATION

JOB NO.: 0451200100 PLOT SCALE: 1=15

STARTED ON: 11/10/92 REVISED: 12/04/92

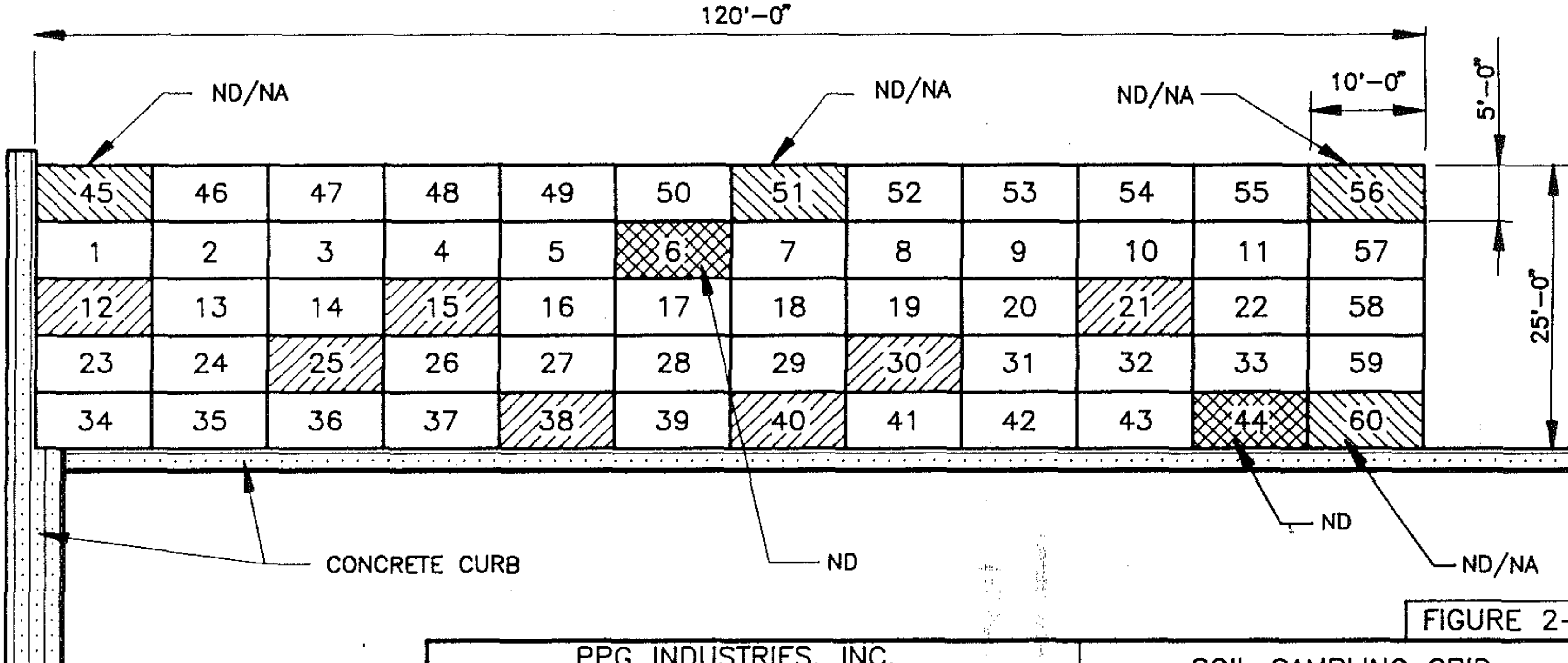


FIGURE 2–2

PPG INDUSTRIES, INC. COATINGS & RESINS DIVISION, CIRCLEVILLE, OHIO	SOIL SAMPLING GRID WEST PAD CLOSURE
ICF KAISER ENGINEERS PITTSBURGH, PA	DATE: 11/10/92 — DR.: D.MAJERNIK SCALE: 1"=15' — DWG. NO.: FIG2–2

2.2.1.3 South Pad Drum Storage

Within the South Pad Drum Storage area previous grids 53, 66, 79, 92, 100 and 105 were re-established. Additional grids, 144-154, were added to the west and southern portions of the grid system. Figure 2-3 illustrates the sampling grids.

2.2.2 Soil Sampling Methodology

Soil samples obtained from new grids were collected at depths of 6-12 inches and 12-24 inches below the ground surface. A biased sampling approach was used to obtain samples from grids previously determined to contain detectable levels of chemicals. These samples were collected at a depth of 12-24 inches below the ground surface. Table 1 summarizes the grid numbers and sampling depths for each closure unit.

All samples were collected utilizing the following procedures. The first 6 inches of soil was removed using a hand-held stainless steel bucket auger. A stainless steel split-spoon was then manually driven to the desired depth to obtain the deeper sample. All sampling equipment was decontaminated between sample locations with a mild detergent followed by a deionized water rinse.

Approximately 4 oz. of material was collected from each split spoon for analysis. The sample was obtained by withdrawing the appropriate amount of soil from the split-spoon with stainless steel spatulas. Labels detailing, the name of the sampler, date, time, method of analysis and any preservatives were marked on the sampling jar. The samples were then placed on ice for shipment to the analytical laboratory.

2.2.3 Sample Analysis

All soil samples were sent by overnight courier to NET, Cambridge Division in Bedford, Massachusetts for analysis. Soil samples were analyzed for Volatile Organic Compounds (VOCs) by EPA SW-846 Method 8240. Samples from the 6-12 inch depth interval were analyzed under a turnaround time of 5 days. The accelerated turnaround time allowed the corresponding 12-24 inch interval samples to be analyzed within the required holding time of 14 days. The initial soil samples were received at the NET Laboratories on September 24 and 25, 1992 and were analyzed by September 30, 1992. The second round of samples were received at the lab on November 2, 1992 and were analyzed by November 6, 1992.

A field blank was submitted to NET for each day of field activity for a total of three samples. NET ran a method blank at the beginning and end of each sample batch. A total of six method blanks were run.

JOB NO.: 0451200100 PLOT SCALE: 1=30

STARTED ON: 11/11/92 REVISED: 12/04/92

ND= NON DETECT
NA= NOT ANALYZED
ug/kg = MICROGRAMS/KILOGRAMS
ND/NA= 6"-12" INTERVAL/12"-24" INTERVAL

PREVIOUS (1989) SAMPLE LOCATION

CURRENT (1992) SAMPLE LOCATION

PREVIOUS/CURRENT SAMPLE LOCATION

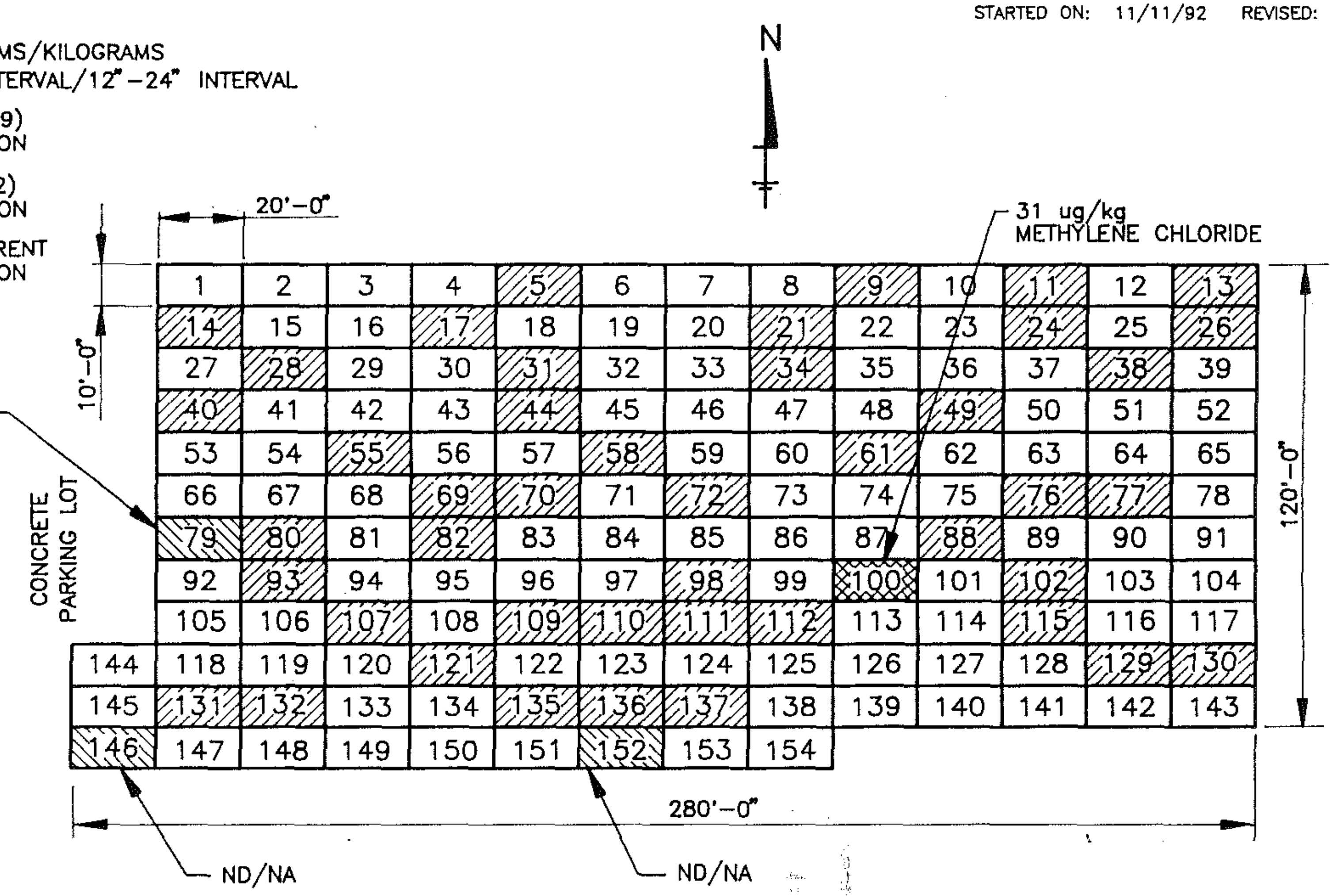


FIGURE 2-3

PPG INDUSTRIES, INC. COATINGS & RESINS DIVISION, CIRCLEVILLE, OHIO	SOIL SAMPLING GRID SOUTH PAD CLOSURE
ICF KAISER ENGINEERS PITTSBURGH, PA	DATE: 11/10/92 — DR.: D.MAJERNIK SCALE: 1"=40' — DWG. NO.: FIG2-3

3.0 INVESTIGATION RESULTS

With the exception of sample CV-92-350-579, all of the initially analyzed samples obtained on September 21-22, 1992 showed non-detectable levels of VOCs. Sample CV-92-350-529 was obtained from Grid 79 at the South Pad Drum Storage Area at the 6-12 inch interval. The sample exhibited a trace concentration of 6.0 ug/kg 4-methyl-2-pentanone (MIBK). A summary of analytical results is included in Table 3-1. Raw analytical data are included as Appendix B.

Three of the five samples analyzed during the second sampling event (October 31, 1992) exhibited detectable concentrations of methylene chloride. These samples, as stated earlier, were obtained from grids previously determined to contain detectable levels of chemicals. Within the Former Liquid Incinerator Pad, the 12-24 inch sample from Grid 24 contained methylene chloride at 21 ug/kg and the 12-24 inch sample from Grid 45 contained methylene chloride at 13 ug/kg. In the South Pad Drum Storage Area, the 12-24 inch sample from Grid 100 exhibited a concentration of 31 μg/kg methylene chloride. None of the West Drum Storage Pad samples showed detectable concentrations of VOCs.

TABLE 3-1

**SOIL SAMPLE SUMMARY
PPG INDUSTRIES, INC.
CIRCLEVILLE, OHIO**

SEPTEMBER, 1992

Sample Number	Sample Location	Sampling Grid	Sample Date	Depth (in.)	Analytical EPA SW-846 Method	Initial Analytical Results
CV-92-330-I34	Incinerator Pad	34	9-24-92	6-12	8240	Non-Detect
CV-92-331-I34	Incinerator Pad	34	9-24-92	12-24	8240	Not Analyzed
CV-92-332-I36	Incinerator Pad	36	9-24-92	6-12	8240	Non-Detect
CV-92-333-I36	Incinerator Pad	36	9-24-92	12-24	8240	Not Analyzed
CV-92-334-I56	Incinerator Pad	56	9-24-92	6-12	8240	Non-Detect
CV-92-335-I56	Incinerator Pad	56	9-24-92	12-24	8240	Not Analyzed
CV-92-336-I113	Incinerator Pad	113	9-24-92	6-12	8240	Non-Detect
CV-92-337-I113	Incinerator Pad	113	9-24-92	12-24	8240	Not Analyzed
CV-92-338-I24	Incinerator Pad	24	9-24-92	12-24	8240	Not Analyzed
CV-92-339-I45	Incinerator Pad	45	9-24-92	12-24	8240	Not Analyzed
CV-92-524-52A	Incinerator Pad	24	10-31-92	12-24	8240	21 ppb Methylene Chloride
CV-92-525-I45	Incinerator Pad	45	10-31-92	12-24	8240	13 ppb Methylene Chloride
CV-92-340-W45	West Storage Pad	45	9-23-92	6-12	8240	Non-Detect
CV-92-341-W45	West Storage Pad	45	9-23-92	12-24	8240	Not Analyzed
CV-92-342-W51	West Storage Pad	51	9-23-92	6-12	8240	Non-Detect
CV-92-343-W51	West Storage Pad	51	9-23-92	12-24	8240	Not Analyzed
CV-92-344-W56	West Storage Pad	56	9-23-92	6-12	8240	Non-Detect
CV-92-345-W56	West Storage Pad	56	9-23-92	12-24	8240	Not Analyzed
CV-92-346-W60	West Storage Pad	60	9-23-92	6-12	8240	Non-Detect
CV-92-347-W60A	West Storage Pad	60	9-23-92	6-12	8240	Non-Detect

TABLE 3-1 (Continued)

SAMPLES COLLECTED AT THE CIRCLEVILLE, OHIO FACILITY

SEPTEMBER, 1992

Sample Number	Sample Location	Sampling Grid	Sample Date	Depth (in.)	Analytical EPA SW-846 Method	Initial Analytical Results
CV-92-359-W60A	West Storage Pad	60	9-23-92	12-24	8240	Not Analyzed
CV-92-348-W6	West Storage Pad	6	9-23-92	12-24	8240	Not Analyzed
CV-92-349-W44	West Storage Pad	44	9-23-92	12-24	8240	Not Analyzed
CV-92-W6	West Storage Pad	6	10-31-92	12-24	8240	Non-Detect
CV-92- -W44	West Storage Pad	44	10-31-92	12-24	8240	Non-Detect
CV-92-350-S79	South Storage Pad	79	9-23-92	6-12	8240	6 ppb MIBK
CV-92-351-S79	South Storage Pad	79	9-23-92	12-24	8240	Non-Detect
CV-92-354-S152	South Storage Pad	152	9-23-92	6-12	8240	Non-Detect
CV-92-355-S152	South Storage Pad	152	9-23-92	12-24	8240	Not Analyzed
CV-92-360-S146	South Storage Pad	146	9-24-92	6-12	8240	Non-Detect
CV-92-353-S146	South Storage Pad	146	9-24-92	12-24	8240	Not Analyzed
CV-92-356-S100	South Storage Pad	100	9-23-92	12-24	8240	Not Analyzed
CV-92-526-S100	South Storage Pad	100	10-31-92	12-24	8240	31 ppb Methylene Chloride

PPB: Parts Per Billion

4.0 DISCUSSION OF RESULTS

The results of the 18 samples analyzed as part of the additional sampling program conducted in September and October 1992 can be summarized as follows:

- Fourteen (14) of the samples showed nondetectable levels of VOCs, including all of the samples taken in the West Drum Storage Pad.
- The samples collected from Grid No. 79 in the South Drum Storage Pad showed 6 ppb of MIBK (which is equivalent to the method detection limit for the compound) at the 6"-12" depth, but no detectable VOCs at the 12" - 24" depth. The 12" - 24" depth sample from Grid 100 in the South Drum Storage Pad area showed detectable levels of methylene chloride.
- The 12"-24" depth samples from grids 24 and 45 in the Former Liquid Incinerator area showed detectable levels of methylene chloride.

Of the methylene chloride detected in three of the samples obtained during this sampling effort, Table 4-1 shows that the levels detected are at least an order of magnitude lower than the methylene chloride in 6"-12" samples from the same grid locations collected in 1989. These results suggest that higher concentrations at intervals deeper than 12"-24" are unlikely.

TABLE 4-1
METHYLENE CHLORIDE DATA SUMMARY
(All Concentrations in μg/kg)

Sampling Interval	Liquid Incinerator		South Drum Storage Pad
	Grid 24	Grid 45	Grid 100
6"-12" Interval (1989)	4,000	400	300
12"-24" Interval (1992)	21	13	31

Based on the analytical results reduced from this recent sampling event, the lateral extent of contamination within each of the three closure areas, (Former Liquid Incinerator Pad, West and South Drum Storage Pads) has been adequately defined. None of the chemicals of concern observed in the previous sampling event were observed in the current sampling event with the exception of methylene chloride and the data indicate that methylene chloride does not increase in concentration with depth. Furthermore, methylene chloride was only observed within the previously sampled grids.

The data obtained from this latest round of sampling will be incorporated into the existing data base for each unit to calculate site risks. Although PPG believes that Ohio EPA's guidance on risk-based RCRA unit closure is based on extremely conservative exposure scenarios, the guidance will be utilized to demonstrate that acceptable levels of risk are present at the three interim status hazardous waste management units and conditions are acceptable for closure.

APPENDIX A

ADDITIONAL SAMPLING PROGRAM CORRESPONDENCE

OhioEPA
State of Ohio Environmental Protection Agency

Central District Office

Street Address:
2305 Westbrooke Drive, Building C
Columbus, Ohio 43228
614-771-7505 FAX 614-771-7571

Mailing Address:
P.O. Box 2198
Columbus, Ohio 43266-2198

George V. Voinovich
Governor

Donald R. Schregardus
Director

August 31, 1992

RE: Closure Appeal Settlement, Partial Closure Plan
Three drum storage areas and liquid waste incinerator
OHD 004 304 689/01-65-0063

Mr. Larry LaDage
Plant Manager
PPG Industries, Incorporated
P.O. Box 457
Circleville, Ohio 43113

Dear Mr. LaDage:

The Ohio EPA has reviewed PPG Industries' July 27, 1992 and subsequent August 7, 1992 proposals for revising the partial closure plan for the three drum storage areas and the old liquid waste incinerator site. With the changes included from the August 7, 1992 revision, the Ohio EPA finds the proposed sampling plan acceptable and approves its implementation. Please contact me prior to the start of sampling so that I may be present to observe operations and procedures. Results from the sample analysis should be submitted to this office for review and evaluation as to whether the full extent of both vertical and horizontal contamination has been determined.

If you have any questions or require further information, please feel free to contact either myself at (614) 771-7505 or Sandra Leibfritz at (614) 644-2956.

Sincerely,

John Paulian
Division of Hazardous Waste Management
Central District Office

JP/sc

cc: Chris Korleski, AGO
Sandra Leibfritz, DHWM, CO
Bryant Riley, PPG

Printed on recycled paper

PPG Industries, Inc.
Post Office Box 457 Circleville, Ohio 43113 USA

Coatings and Resins

August 7, 1992

Mr. John Paulain
Ohio EPA Central District Office
Division of Hazardous Waste Management
2305 Westbrooke Drive, Building C
Columbus, Ohio 43228

Re: Closure Plan
Three Drum Storage Areas & Liquid Incinerator
OHD004304689

Dear John:

In reference to our discussion during your site visit on Tuesday, August 4, PPG Industries amends the following item in our July 27, 1992 letter regarding the Partial Closure at the Circleville, Ohio facility:

Item 3. Additional Sampling:

a. INCINERATOR AREA: In order to further define the extent of contamination as determined by the previous round of sampling, additional sampling grids are added to the western boundary of the existing incinerator area grid (see attached Figure 1 Revision 1.0). Using the biased sampling approach, an additional sample will be obtained from grid 113. Sampling method and analytical protocol will be the same as described in the proposal of July 27.

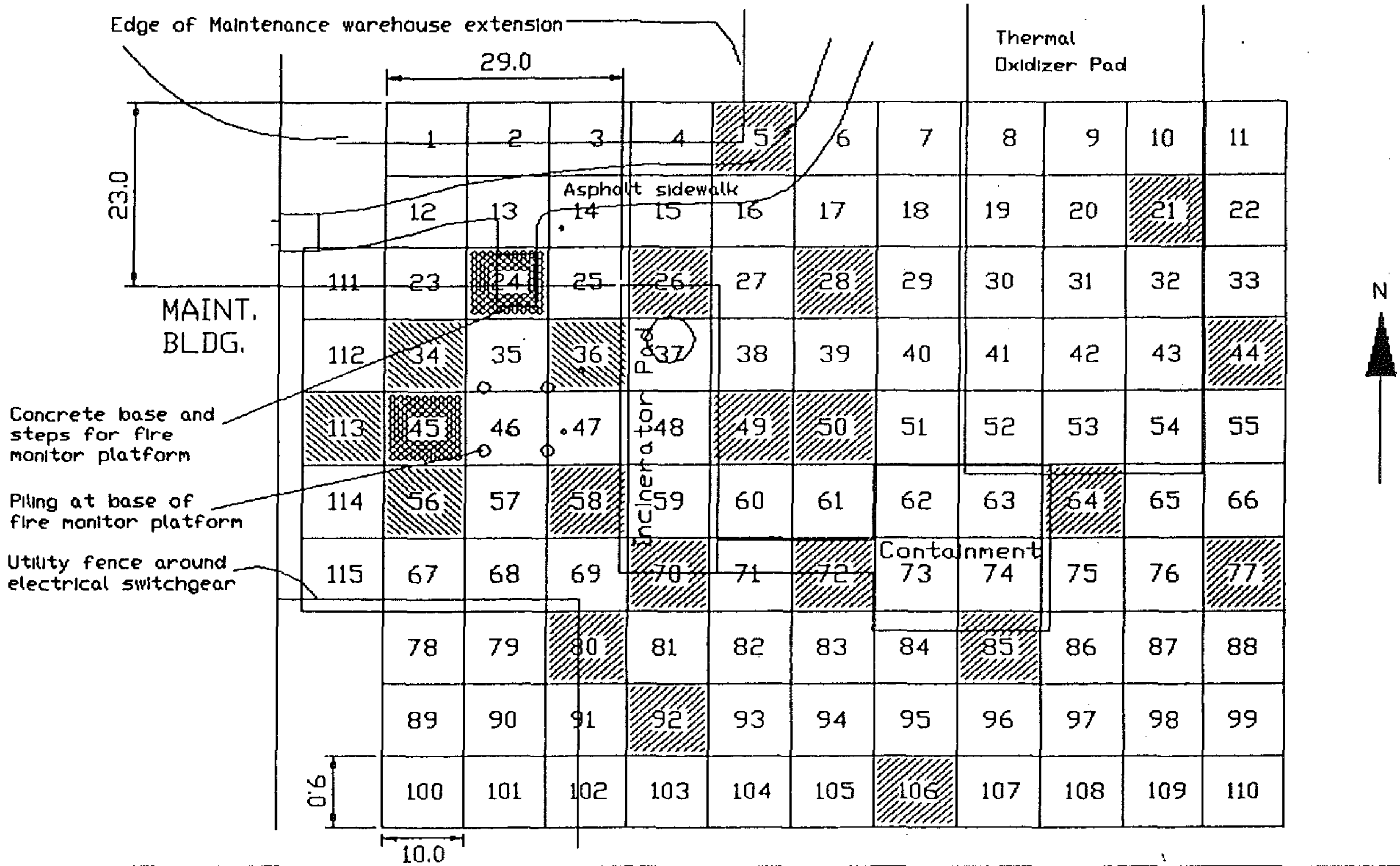
Please feel free to call if you have any questions.

Sincerely yours,

Bryant H Riley

Bryant Riley

cc: M. Broz, PPG
J. Karas, PPG
C. Waterman, Bricker & Eckler



PPG INDUSTRIES, INC.

COATINGS & RESINS DIVISION, CIRCLEVILLE, OHIO

SOIL SAMPLING GRID; INCINERATOR AREA

SCALE: 1"=18'-0"

DATE: 7/20/92 BY: B. Riley

FIGURE 1 Rev. 1.0 (8/5/92)

PPG Industries, Inc.
Post Office Box 457 Circleville, Ohio 43113 USA

Coatings and Resins

July 27, 1992

Mr. John Paulian
OhioEPA Central District Office
Division of Hazardous Waste Management
2305 Westbrooke Dive, Building C
Columbus, Ohio 43228

Re: Closure Plan
Three Drum Storage Areas & Liquid Incinerator
OHD 004 304 689

Dear Mr. Paulian:

This letter is being provided in response to the letter from you dated June 1, 1992 regarding the Partial Closure Plan for three drum storage areas and the liquid incinerator at PPG Industries, Inc. (PPG) facility in Circleville, Ohio. We offer the following responses to the items in that letter:

Item 1. PCB Contamination:

Documentation that PCB levels recorded in the south pad soils and in the incinerator soils are unrelated to RCRA activities will be included in the revised Partial Closure Plan. The Partial Closure Plan will be revised to reflect the approved responses to OEPA comments after OEPA concurrence with the contents of this letter.

Item 2. Corrective action levels:

We acknowledge your response to this item.

Item 3. Additional Sampling:

a. INCINERATOR AREA: PPG proposes to use already established sampling grids 34-36, 45-47 and 56-58 to further characterize soils to the north and west of the old incinerator (See attached Figure 1). A biased sampling approach will be used and soil samples will be obtained from grids 34, 36 and 56. Samples from these grids will be taken at depths of 6-12 inches and 12-24 inches below grade to further characterize the possible horizontal and vertical extent of contamination. The 12-24 inch samples will be analyzed only if VOCs, which are verified as not being laboratory contaminants per QA/QC procedures, are detected at the 6-12 inch depth. Samples will also be taken beneath previously sampled grids 24 and 45 at a depth of 12-24 inches below grade to characterize the possible vertical extent of contamination. (Note that, as indicated in Figure 1, a stairway is presently located in a portion of Grid 24.)

WEST PAD AREA: PPG proposes to use 16 new sampling grids (45 to 60) along the north and western boundaries of the existing grid to further characterize soils to the north and west of the west pad area (See attached Figure 2). A biased sampling approach will be used and soil samples will be obtained from grids 45, 51, 56 and 60. Samples from these grids will be taken at depths of 6-12 inches and 12-24 inches below grade to further characterize the possible horizontal and vertical extent of contamination. The 12-24 inch samples will be analyzed only if VOCs, which are verified as not being laboratory contaminants per QA/QC procedures, are detected at the 6-12 inch depth. Samples will also be taken beneath previously sampled grids 6 and 44 at a depth of 12-24 inches below grade to characterize the possible vertical extent of contamination.

SOUTH PAD AREA: A truck parking pad (concrete slab) is located directly adjacent and west of the existing grid system for the South Pad. For this reason, PPG proposes to use 5 existing grids which were not previously sampled (53, 66, 79, 92 and 105) as well as 11 new sampling grids (144 to 154) to further characterize soils to the southwest of the pad (See attached Figure 3). The new grids will include a one grid extension to the west of grids 118 and 131 and a one grid extension south of grids 131 through 138. A biased sampling approach will be used and soil samples will be obtained from grids 79, 146, and 152. Samples from these grids will be taken at depths of 6-12 inches and 12-24 inches below grade to further characterize the possible horizontal and vertical extent of contamination. The 12-24 inch samples will be analyzed only if VOCs, which are verified as not being laboratory contaminants per QA/QC procedures, are detected at the 6-12 inch depth. A sample will also be taken beneath previously sampled grid 100 at a depth of 12-24 inches below grade to characterize the possible vertical extent of contamination.

The analysis of the samples will be performed using SW-846, Method 8240. Samples will be collected by advancing a hand or power auger to the specified depth and then collecting the sample in a soil probe.

b. See proposed sampling for extent of vertical contamination under a. above.

c. If the results of the additional sampling program proposed under a. above do not result in a clear demarcation of the RCRA units of concern subject to closure activities, then PPG will provide information concerning past site operations and management practices.

d. We acknowledge your comment on this item.

e. We acknowledge your comment on this item.

PPG is requesting a response to this letter within two (2) weeks of its receipt so that sampling activities can be initiated in an expeditious manner. Note that we will inform you prior to the actual start of the sampling program so that you may be present to observe the sampling activities.

After the contents of this letter are approved and the additional sampling is completed, PPG intends to modify the Partial Closure Plan to reflect the approved responses and sampling results.

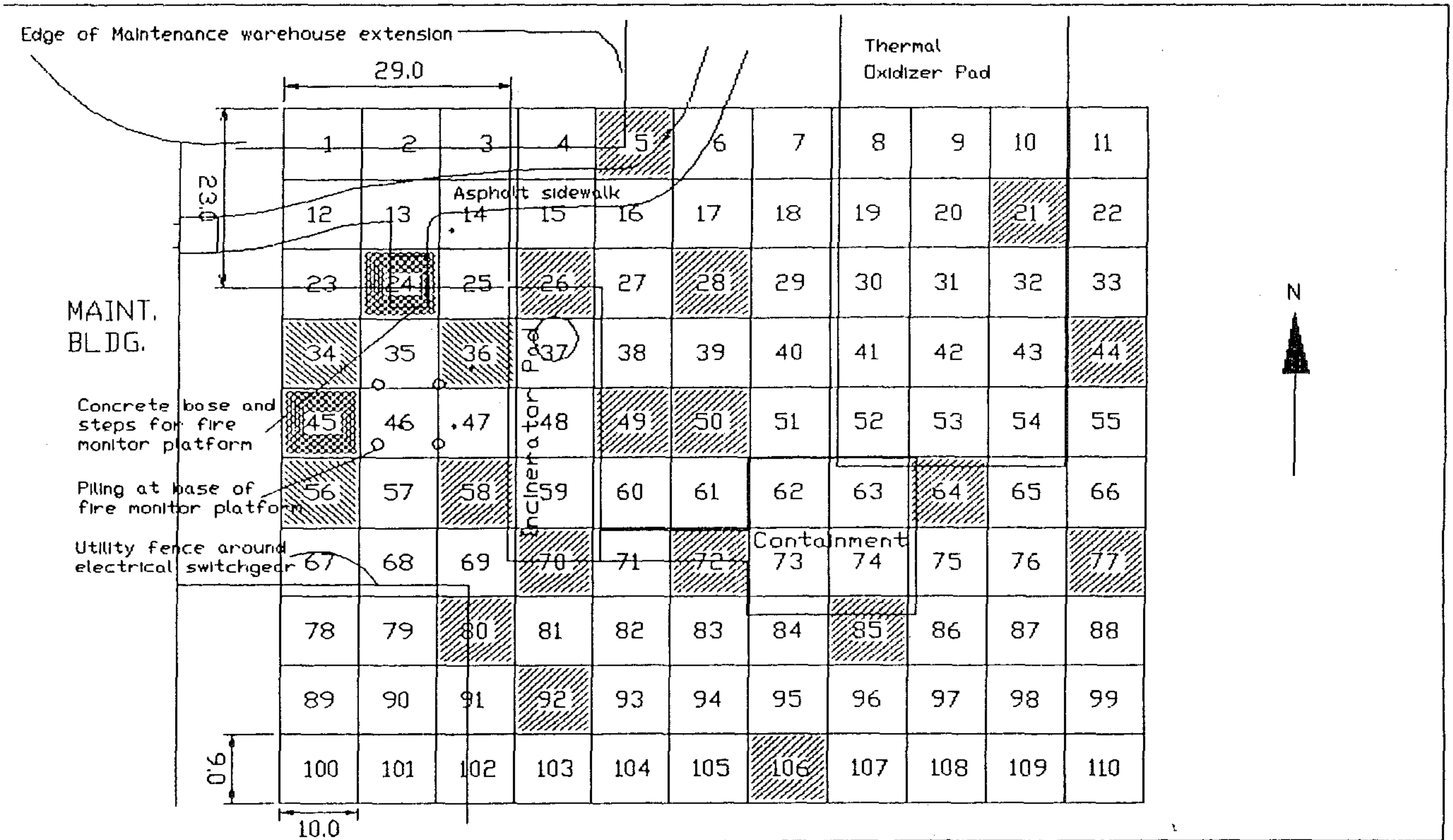
Please feel free to call if you have any questions.

Sincerely,

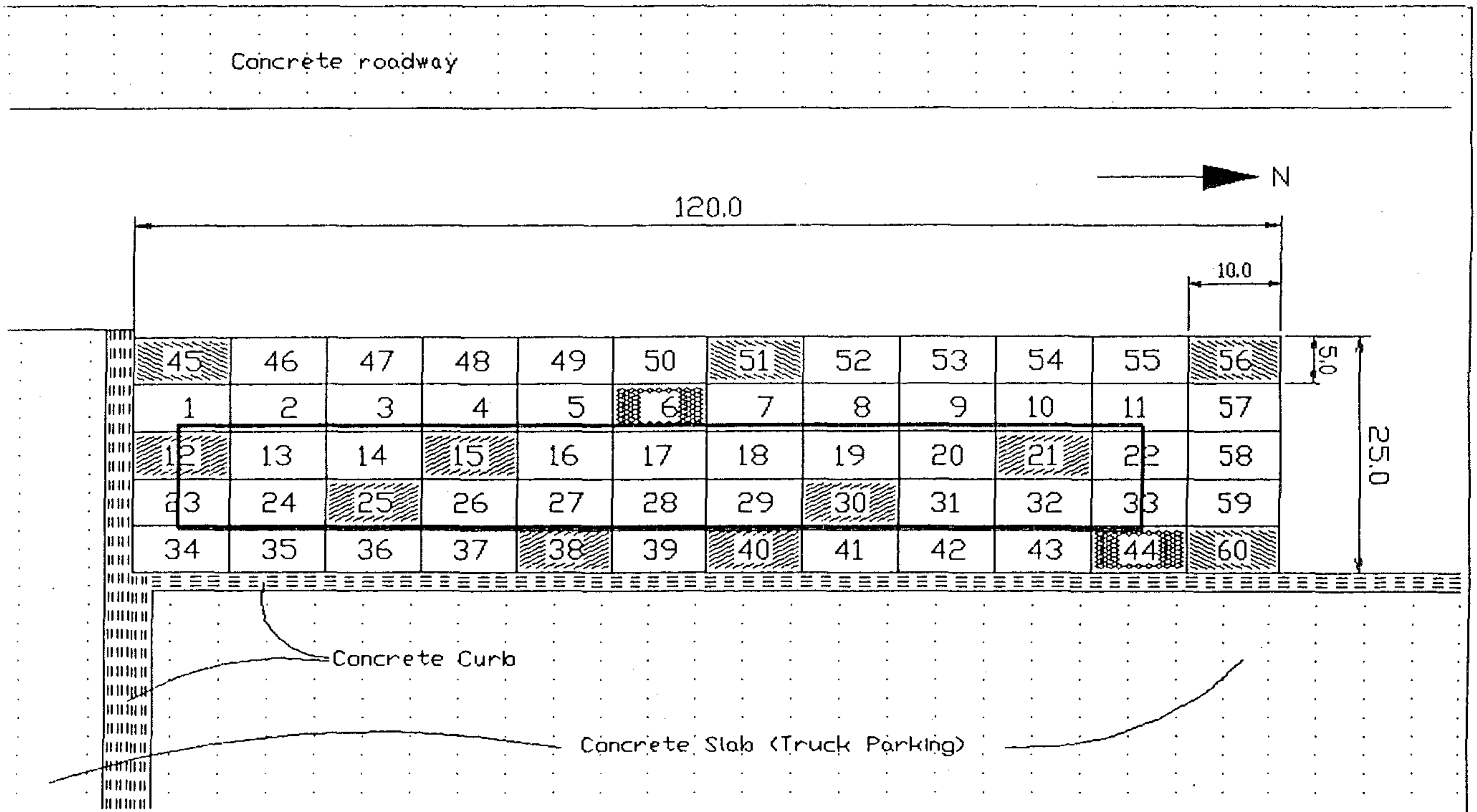
David W Weber for L. LaDage

Larry LaDage
Plant Manager

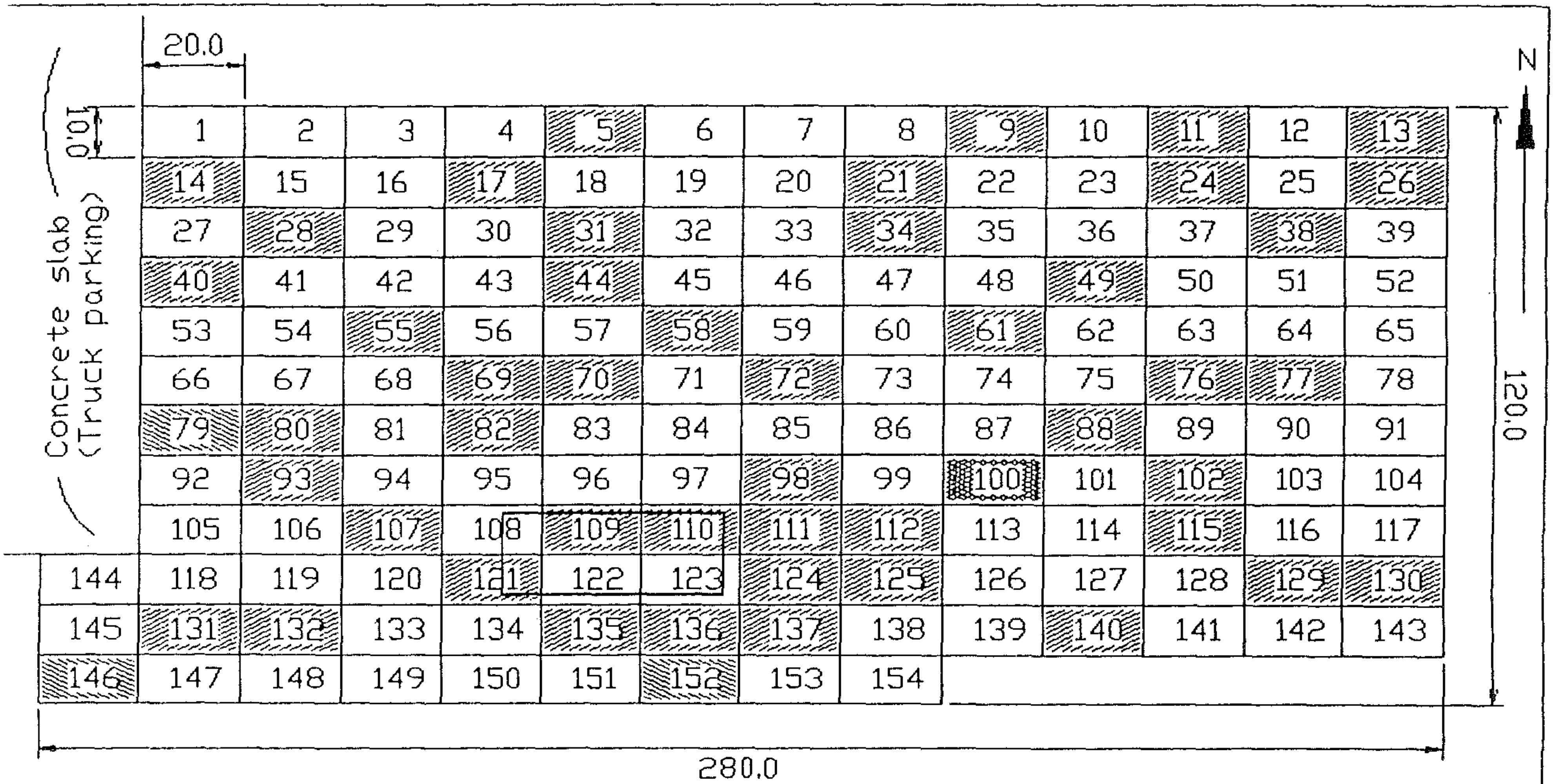
cc: M. Broz, PPG/file CR 310 (1992)
J. Karas, PPG
B. Riley, PPG
C. Waterman, Bricker & Eckler



PPG INDUSTRIES, INC.	SCALE: 1"=18'-0"
COATINGS & RESINS DIVISION, CIRCLEVILLE, OHIO	DATE: 7/20/92 BY: B. Riley
SOIL SAMPLING GRID; INCINERATOR AREA	FIGURE 1



PPG INDUSTRIES, INC.	SCALE: 1" = 15'-0"
COATINGS & RESINS DIVISION, CIRCLEVILLE, OHIO	DATE: 7/19/92 BY: B. Riley
SOIL SAMPLING GRID; WEST PAD CLOSURE	FIGURE 2



PPG INDUSTRIES, INC.	SCALE: 1"=30'-0"
COATINGS & RESINS DIVISION, CIRCLEVILLE, OHIO	DATE: 7/20/92 BY: B. Riley
	FIGURE 3
SOIL SAMPLING GRID; SOUTH PAD CLOSURE	

APPENDIX B

LABORATORY RAW DATA

ANALYTICAL REPORT

Report To:	Mr. Robert Bear ICF Kaiser Engineers Four Gateway Center 12th Floor Pittsburgh, PA 15222
Project:	PPG RUSH SOIL VOAs

09/30/1992

NET Job Number: 92.34112

National Environmental Testing

NET Atlantic, Inc.
Cambridge Division
12 Oak Park
Bedford, MA 01730

NET

NET Cambridge Division

ANALYTICAL REPORT

Report To:	Reported By:
Mr. Robert Bear ICF Kaiser Engineers Four Gateway Center 12th Floor Pittsburgh, PA 15222	National Environmental Testing NET Atlantic, Incorporated Cambridge Division 12 Oak Park Bedford, MA 01730

Report Date: 09/30/1992 Collected By: ICF NET Job Number: 92.34112

Project: PPG RUSH SOIL VOAs Shipped Via: FEDEX Client P.O. No: bill to ICF dir

Job Description: PPG RUSH SOIL VOAs Airbill No: 4450798251 NET Client No: 49655

This report has been approved and certified for release by the following staff. Please feel free to call the NET Project Manager at 617-275-3535 with any questions or comments.

Edward A. Lawler
Edward A. Lawler
NET Project Manager

Michael F. Delaney
Michael F. Delaney, Ph.D.
Laboratory Director

Analytical data for the following samples are included in this data report.

SAMPLE ID	NET ID	DATE TAKEN	TIME TAKEN	DATE REC'D	MATRIX
CV-92-350-S79	67046	09/23/1992	16:45	09/24/1992	SOIL
CV-92-354-S152	67047	09/23/1992	17:10	09/24/1992	SOIL
CV-92-340-W45	67048	09/23/1992	13:38	09/24/1992	SOIL
CV-92-342-W51	67049	09/23/1992	10:50	09/24/1992	SOIL
CV-92-344-W56	67050	09/23/1992	12:19	09/24/1992	SOIL
CV-92-346-W60	67051	09/23/1992	12:50	09/24/1992	SOIL
CV-92-347-W60A	67052	09/23/1992	13:10	09/24/1992	SOIL
CV-92-351-FBW	67053	09/23/1992	13:10	09/24/1992	BLANK
CV-92-330-I34	67138	09/24/1992	09:06	09/25/1992	SOIL
CV-92-332-I36	67139	09/24/1992	09:32	09/25/1992	SOIL
CV-92-334-I56	67140	09/24/1992	08:30	09/25/1992	SOIL
CV-92-336-I113	67141	09/24/1992	08:30	09/25/1992	SOIL
CV-92-358-FBI	67142	09/24/1992	10:15	09/25/1992	BLANK
CV-92-360-S146	67143	09/24/1992	11:20	09/25/1992	SOIL

NET

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34096

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/24/1992

Sample ID: CV-92-350-S79

NET Sample No: 67046

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<5.0	ug/Kg	09/25/1992	dry
Benzene	<5.0	ug/Kg		
Bromodichloromethane	<5.0	ug/Kg		
Bromoform	<5.0	ug/Kg		
Bromomethane	<5.0	ug/Kg		
2-Butanone (MEK)	<5.0	ug/Kg		
Carbon Disulfide	<5.0	ug/Kg		
Carbon Tetrachloride	<5.0	ug/Kg		
Chlorobenzene	<5.0	ug/Kg		
Chloroethane	<5.0	ug/Kg		
2-Chloroethylvinyl ether	<5.0	ug/Kg		
Chloroform	<5.0	ug/Kg		
Chloromethane	<5.0	ug/Kg		
Dibromochloromethane	<5.0	ug/Kg		
1,2-Dichlorobenzene	<5.0	ug/Kg		
1,3-Dichlorobenzene	<5.0	ug/Kg		
1,4-Dichlorobenzene	<5.0	ug/Kg		
1,1-Dichloroethane	<5.0	ug/Kg		
1,2-Dichloroethane	<5.0	ug/Kg		
1,1-Dichloroethene	<5.0	ug/Kg		
trans-1,2-Dichloroethene	<5.0	ug/Kg		
1,2-Dichloropropane	<5.0	ug/Kg		
cis-1,3-Dichloropropene	<5.0	ug/Kg		
trans-1,3-Dichloropropene	<5.0	ug/Kg		
Ethylbenzene	<5.0	ug/Kg		
2-Hexanone	<5.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	6	ug/Kg		
Methylene Chloride	<5.0	ug/Kg		
Styrene	<5.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg		
Tetrachloroethene	<5.0	ug/Kg		
Toluene	<5.0	ug/Kg		
1,1,1-Trichloroethane	<5.0	ug/Kg		
1,1,2-Trichloroethane	<5.0	ug/Kg		
Trichloroethene	<5.0	ug/Kg		
Trichlorofluoromethane	<5.0	ug/Kg		
Vinyl Acetate	<5.0	ug/Kg		
Vinyl Chloride	<5.0	ug/Kg		
m-Xylene	<5.0	ug/Kg		
o-Xylene	<5.0	ug/Kg		
p-Xylene	<5.0	ug/Kg		

NET

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34096

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/24/1992

Sample ID: CV-92-354-S152

NET Sample No: 67047

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<6.0	ug/Kg	09/25/1992	dry
Benzene	<6.0	ug/Kg		
Bromodichloromethane	<6.0	ug/Kg		
Bromoform	<6.0	ug/Kg		
Bromomethane	<6.0	ug/Kg		
2-Butanone (MEK)	<6.0	ug/Kg		
Carbon Disulfide	<6.0	ug/Kg		
Carbon Tetrachloride	<6.0	ug/Kg		
Chlorobenzene	<6.0	ug/Kg		
Chloroethane	<6.0	ug/Kg		
2-Chloroethylvinyl ether	<6.0	ug/Kg		
Chloroform	<6.0	ug/Kg		
Chloromethane	<6.0	ug/Kg		
Dibromochloromethane	<6.0	ug/Kg		
1,2-Dichlorobenzene	<6.0	ug/Kg		
1,3-Dichlorobenzene	<6.0	ug/Kg		
1,4-Dichlorobenzene	<6.0	ug/Kg		
1,1-Dichloroethane	<6.0	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg		
1,1-Dichloroethene	<6.0	ug/Kg		
trans-1,2-Dichloroethene	<6.0	ug/Kg		
1,2-Dichloropropane	<6.0	ug/Kg		
cis-1,3-Dichloropropene	<6.0	ug/Kg		
trans-1,3-Dichloropropene	<6.0	ug/Kg		
Ethylbenzene	<6.0	ug/Kg		
2-Hexanone	<6.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
Methylene Chloride	<6.0	ug/Kg		
Styrene	<6.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg		
Tetrachloroethene	<6.0	ug/Kg		
Toluene	<6.0	ug/Kg		
1,1,1-Trichloroethane	<6.0	ug/Kg		
1,1,2-Trichloroethane	<6.0	ug/Kg		
Trichloroethene	<6.0	ug/Kg		
Trichlorofluoromethane	<6.0	ug/Kg		
Vinyl Acetate	<6.0	ug/Kg		
Vinyl Chloride	<6.0	ug/Kg		
m-Xylene	<6.0	ug/Kg		
o-Xylene	<6.0	ug/Kg		
p-Xylene	<6.0	ug/Kg		

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34096

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/24/1992

Sample ID: CV-92-340-W45

NET Sample No: 67048

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<6.0	ug/Kg	09/25/1992	dry
Benzene	<6.0	ug/Kg		
Bromodichloromethane	<6.0	ug/Kg		
Bromoform	<6.0	ug/Kg		
Bromomethane	<6.0	ug/Kg		
2-Butanone (MEK)	<6.0	ug/Kg		
Carbon Disulfide	<6.0	ug/Kg		
Carbon Tetrachloride	<6.0	ug/Kg		
Chlorobenzene	<6.0	ug/Kg		
Chloroethane	<6.0	ug/Kg		
2-Chloroethylvinyl ether	<6.0	ug/Kg		
Chloroform	<6.0	ug/Kg		
Chloromethane	<6.0	ug/Kg		
Dibromochloromethane	<6.0	ug/Kg		
1,2-Dichlorobenzene	<6.0	ug/Kg		
1,3-Dichlorobenzene	<6.0	ug/Kg		
1,4-Dichlorobenzene	<6.0	ug/Kg		
1,1-Dichloroethane	<6.0	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg		
1,1-Dichloroethene	<6.0	ug/Kg		
trans-1,2-Dichloroethene	<6.0	ug/Kg		
1,2-Dichloropropane	<6.0	ug/Kg		
cis-1,3-Dichloropropene	<6.0	ug/Kg		
trans-1,3-Dichloropropene	<6.0	ug/Kg		
Ethylbenzene	<6.0	ug/Kg		
2-Hexanone	<6.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
Methylene Chloride	<6.0	ug/Kg		
Styrene	<6.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg		
Tetrachloroethene	<6.0	ug/Kg		
Toluene	<6.0	ug/Kg		
1,1,1-Trichloroethane	<6.0	ug/Kg		
1,1,2-Trichloroethane	<6.0	ug/Kg		
Trichloroethene	<6.0	ug/Kg		
Trichlorofluoromethane	<6.0	ug/Kg		
Vinyl Acetate	<6.0	ug/Kg		
Vinyl Chloride	<6.0	ug/Kg		
m-Xylene	<6.0	ug/Kg		
o-Xylene	<6.0	ug/Kg		
p-Xylene	<6.0	ug/Kg		

NET

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34096

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/24/1992

Sample ID: CV-92-342-W51

NET Sample No: 67049

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<6.0	ug/Kg	09/25/1992	dry
Benzene	<6.0	ug/Kg		
Bromodichloromethane	<6.0	ug/Kg		
Bromoform	<6.0	ug/Kg		
Bromomethane	<6.0	ug/Kg		
2-Butanone (MEK)	<6.0	ug/Kg		
Carbon Disulfide	<6.0	ug/Kg		
Carbon Tetrachloride	<6.0	ug/Kg		
Chlorobenzene	<6.0	ug/Kg		
Chloroethane	<6.0	ug/Kg		
2-Chloroethylvinyl ether	<6.0	ug/Kg		
Chloroform	<6.0	ug/Kg		
Chloromethane	<6.0	ug/Kg		
Dibromochloromethane	<6.0	ug/Kg		
1,2-Dichlorobenzene	<6.0	ug/Kg		
1,3-Dichlorobenzene	<6.0	ug/Kg		
1,4-Dichlorobenzene	<6.0	ug/Kg		
1,1-Dichloroethane	<6.0	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg		
1,1-Dichloroethene	<6.0	ug/Kg		
trans-1,2-Dichloroethene	<6.0	ug/Kg		
1,2-Dichloropropane	<6.0	ug/Kg		
cis-1,3-Dichloropropene	<6.0	ug/Kg		
trans-1,3-Dichloropropene	<6.0	ug/Kg		
Ethylbenzene	<6.0	ug/Kg		
2-Hexanone	<6.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
Methylene Chloride	<6.0	ug/Kg		
Styrene	<6.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg		
Tetrachloroethene	<6.0	ug/Kg		
Toluene	<6.0	ug/Kg		
1,1,1-Trichloroethane	<6.0	ug/Kg		
1,1,2-Trichloroethane	<6.0	ug/Kg		
Trichloroethene	<6.0	ug/Kg		
Trichlorofluoromethane	<6.0	ug/Kg		
Vinyl Acetate	<6.0	ug/Kg		
Vinyl Chloride	<6.0	ug/Kg		
m-Xylene	<6.0	ug/Kg		
o-Xylene	<6.0	ug/Kg		
p-Xylene	<6.0	ug/Kg		

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 09/30/1992

Report To: ICF Kaiser Engineers | NET Job No: 92.34096

Project: PPG RUSH SOIL VOAs | Date Rec'd: 09/24/1992

Sample ID: CV-92-344-W56

NET Sample No: 67050

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<5.0	ug/Kg	09/25/1992	dry
Benzene	<5.0	ug/Kg		
Bromodichloromethane	<5.0	ug/Kg		
Bromoform	<5.0	ug/Kg		
Bromomethane	<5.0	ug/Kg		
2-Butanone (MEK)	<5.0	ug/Kg		
Carbon Disulfide	<5.0	ug/Kg		
Carbon Tetrachloride	<5.0	ug/Kg		
Chlorobenzene	<5.0	ug/Kg		
Chloroethane	<5.0	ug/Kg		
2-Chloroethylvinyl ether	<5.0	ug/Kg		
Chloroform	<5.0	ug/Kg		
Chloromethane	<5.0	ug/Kg		
Dibromochloromethane	<5.0	ug/Kg		
1,2-Dichlorobenzene	<5.0	ug/Kg		
1,3-Dichlorobenzene	<5.0	ug/Kg		
1,4-Dichlorobenzene	<5.0	ug/Kg		
1,1-Dichloroethane	<5.0	ug/Kg		
1,2-Dichloroethane	<5.0	ug/Kg		
1,1-Dichloroethene	<5.0	ug/Kg		
trans-1,2-Dichloroethene	<5.0	ug/Kg		
1,2-Dichloropropane	<5.0	ug/Kg		
cis-1,3-Dichloropropene	<5.0	ug/Kg		
trans-1,3-Dichloropropene	<5.0	ug/Kg		
Ethylbenzene	<5.0	ug/Kg		
2-Hexanone	<5.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<5.0	ug/Kg		
Methylene Chloride	<5.0	ug/Kg		
Styrene	<5.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg		
Tetrachloroethene	<5.0	ug/Kg		
Toluene	<5.0	ug/Kg		
1,1,1-Trichloroethane	<5.0	ug/Kg		
1,1,2-Trichloroethane	<5.0	ug/Kg		
Trichloroethene	<5.0	ug/Kg		
Trichlorofluoromethane	<5.0	ug/Kg		
Vinyl Acetate	<5.0	ug/Kg		
Vinyl Chloride	<5.0	ug/Kg		
m-Xylene	<5.0	ug/Kg		
o-Xylene	<5.0	ug/Kg		
p-Xylene	<5.0	ug/Kg		

NET

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34096

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/24/1992

Sample ID: CV-92-346-W60

NET Sample No: 67051

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<6.0	ug/Kg	09/25/1992	dry
Benzene	<6.0	ug/Kg		
Bromodichloromethane	<6.0	ug/Kg		
Bromoform	<6.0	ug/Kg		
Bromomethane	<6.0	ug/Kg		
2-Butanone (MEK)	<6.0	ug/Kg		
Carbon Disulfide	<6.0	ug/Kg		
Carbon Tetrachloride	<6.0	ug/Kg		
Chlorobenzene	<6.0	ug/Kg		
Chloroethane	<6.0	ug/Kg		
2-Chloroethylvinyl ether	<6.0	ug/Kg		
Chloroform	<6.0	ug/Kg		
Chloromethane	<6.0	ug/Kg		
Dibromochloromethane	<6.0	ug/Kg		
1,2-Dichlorobenzene	<6.0	ug/Kg		
1,3-Dichlorobenzene	<6.0	ug/Kg		
1,4-Dichlorobenzene	<6.0	ug/Kg		
1,1-Dichloroethane	<6.0	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg		
1,1-Dichloroethene	<6.0	ug/Kg		
trans-1,2-Dichloroethene	<6.0	ug/Kg		
1,2-Dichloropropane	<6.0	ug/Kg		
cis-1,3-Dichloropropene	<6.0	ug/Kg		
trans-1,3-Dichloropropene	<6.0	ug/Kg		
Ethylbenzene	<6.0	ug/Kg		
2-Hexanone	<6.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
Methylene Chloride	<6.0	ug/Kg		
Styrene	<6.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg		
Tetrachloroethene	<6.0	ug/Kg		
Toluene	<6.0	ug/Kg		
1,1,1-Trichloroethane	<6.0	ug/Kg		
1,1,2-Trichloroethane	<6.0	ug/Kg		
Trichloroethene	<6.0	ug/Kg		
Trichlorofluoromethane	<6.0	ug/Kg		
Vinyl Acetate	<6.0	ug/Kg		
Vinyl Chloride	<6.0	ug/Kg		
m-Xylene	<6.0	ug/Kg		
o-Xylene	<6.0	ug/Kg		
p-Xylene	<6.0	ug/Kg		

NET

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34096

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/24/1992

Sample ID: CV-92-347-W60A

NET Sample No: 67052

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<5.0	ug/Kg	09/25/1992	dry
Benzene	<5.0	ug/Kg		
Bromodichloromethane	<5.0	ug/Kg		
Bromoform	<5.0	ug/Kg		
Bromomethane	<5.0	ug/Kg		
2-Butanone (MEK)	<5.0	ug/Kg		
Carbon Disulfide	<5.0	ug/Kg		
Carbon Tetrachloride	<5.0	ug/Kg		
Chlorobenzene	<5.0	ug/Kg		
Chloroethane	<5.0	ug/Kg		
2-Chloroethylvinyl ether	<5.0	ug/Kg		
Chloroform	<5.0	ug/Kg		
Chloromethane	<5.0	ug/Kg		
Dibromochloromethane	<5.0	ug/Kg		
1,2-Dichlorobenzene	<5.0	ug/Kg		
1,3-Dichlorobenzene	<5.0	ug/Kg		
1,4-Dichlorobenzene	<5.0	ug/Kg		
1,1-Dichloroethane	<5.0	ug/Kg		
1,2-Dichloroethane	<5.0	ug/Kg		
1,1-Dichloroethene	<5.0	ug/Kg		
trans-1,2-Dichloroethene	<5.0	ug/Kg		
1,2-Dichloropropane	<5.0	ug/Kg		
cis-1,3-Dichloropropene	<5.0	ug/Kg		
trans-1,3-Dichloropropene	<5.0	ug/Kg		
Ethylbenzene	<5.0	ug/Kg		
2-Hexanone	<5.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<5.0	ug/Kg		
Methylene Chloride	<5.0	ug/Kg		
Styrene	<5.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg		
Tetrachloroethene	<5.0	ug/Kg		
Toluene	<5.0	ug/Kg		
1,1,1-Trichloroethane	<5.0	ug/Kg		
1,1,2-Trichloroethane	<5.0	ug/Kg		
Trichloroethene	<5.0	ug/Kg		
Trichlorofluoromethane	<5.0	ug/Kg		
Vinyl Acetate	<5.0	ug/Kg		
Vinyl Chloride	<5.0	ug/Kg		
m-Xylene	<5.0	ug/Kg		
o-Xylene	<5.0	ug/Kg		
p-Xylene	<5.0	ug/Kg		

NET

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34096

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/24/1992

Sample ID: CV-92-351-FBW

NET Sample No: 67053

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 624 AQ				
Acetone	<5.0	ug/L	09/30/1992	mfw
Benzene	<5.0	ug/L		
Bromodichloromethane	<5.0	ug/L		
Bromoform	<5.0	ug/L		
Bromomethane	<5.0	ug/L		
2-Butanone (MEK)	<5.0	ug/L		
Carbon Disulfide	<5.0	ug/L		
Carbon Tetrachloride	<5.0	ug/L		
Chlorobenzene	<5.0	ug/L		
Chloroethane	<5.0	ug/L		
2-Chloroethylvinyl ether	<5.0	ug/L		
Chloroform	<5.0	ug/L		
Chloromethane	<5.0	ug/L		
Dibromochloromethane	<5.0	ug/L		
1,2-Dichlorobenzene	<5.0	ug/L		
1,3-Dichlorobenzene	<5.0	ug/L		
1,4-Dichlorobenzene	<5.0	ug/L		
1,1-Dichloroethane	<5.0	ug/L		
1,2-Dichloroethane	<5.0	ug/L		
1,1-Dichloroethene	<5.0	ug/L		
trans-1,2-Dichloroethene	<5.0	ug/L		
1,2-Dichloropropane	<5.0	ug/L		
cis-1,3-Dichloropropene	<5.0	ug/L		
trans-1,3-Dichloropropene	<5.0	ug/L		
Ethylbenzene	<5.0	ug/L		
2-Hexanone	<5.0	ug/L		
4-Methyl-2-pentanone (MIBK	<5.0	ug/L		
Methylene Chloride	<5.0	ug/L		
Styrene	<5.0	ug/L		
1,1,2,2-Tetrachloroethane	<5.0	ug/L		
Tetrachloroethene	<5.0	ug/L		
Toluene	<5.0	ug/L		
1,1,1-Trichloroethane	<5.0	ug/L		
1,1,2-Trichloroethane	<5.0	ug/L		
Trichloroethene	<5.0	ug/L		
Trichlorofluoromethane	<5.0	ug/L		
Vinyl Acetate	<5.0	ug/L		
Vinyl Chloride	<5.0	ug/L		
m-Xylene	<5.0	ug/L		
o-Xylene	<5.0	ug/L		
p-Xylene	<5.0	ug/L		

NET

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34112

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/25/1992

Sample ID: CV-92-330-134

NET Sample No: 67138

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<6.0	ug/Kg	09/29/1992	dry
Benzene	<6.0	ug/Kg		
Bromodichloromethane	<6.0	ug/Kg		
Bromoform	<6.0	ug/Kg		
Bromomethane	<6.0	ug/Kg		
2-Butanone (MEK)	<6.0	ug/Kg		
Carbon Disulfide	<6.0	ug/Kg		
Carbon Tetrachloride	<6.0	ug/Kg		
Chlorobenzene	<6.0	ug/Kg		
Chloroethane	<6.0	ug/Kg		
2-Chloroethylvinyl ether	<6.0	ug/Kg		
Chloroform	<6.0	ug/Kg		
Chloromethane	<6.0	ug/Kg		
Dibromochloromethane	<6.0	ug/Kg		
1,2-Dichlorobenzene	<6.0	ug/Kg		
1,3-Dichlorobenzene	<6.0	ug/Kg		
1,4-Dichlorobenzene	<6.0	ug/Kg		
1,1-Dichloroethane	<6.0	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg		
1,1-Dichloroethene	<6.0	ug/Kg		
trans-1,2-Dichloroethene	<6.0	ug/Kg		
1,2-Dichloropropane	<6.0	ug/Kg		
cis-1,3-Dichloropropene	<6.0	ug/Kg		
trans-1,3-Dichloropropene	<6.0	ug/Kg		
Ethylbenzene	<6.0	ug/Kg		
2-Hexanone	<6.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
Methylene Chloride	<6.0	ug/Kg		
Styrene	<6.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg		
Tetrachloroethene	<6.0	ug/Kg		
Toluene	<6.0	ug/Kg		
1,1,1-Trichloroethane	<6.0	ug/Kg		
1,1,2-Trichloroethane	<6.0	ug/Kg		
Trichloroethene	<6.0	ug/Kg		
Trichlorofluoromethane	<6.0	ug/Kg		
Vinyl Acetate	<6.0	ug/Kg		
Vinyl Chloride	<6.0	ug/Kg		
m-Xylene	<6.0	ug/Kg		
o-Xylene	<6.0	ug/Kg		
p-Xylene	<6.0	ug/Kg		

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34112

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/25/1992

Sample ID: CV-92-332-136

NET Sample No: 67139

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<6.0	ug/Kg	09/29/1992	dry
Benzene	<6.0	ug/Kg		
Bromodichloromethane	<6.0	ug/Kg		
Bromoform	<6.0	ug/Kg		
Bromomethane	<6.0	ug/Kg		
2-Butanone (MEK)	<6.0	ug/Kg		
Carbon Disulfide	<6.0	ug/Kg		
Carbon Tetrachloride	<6.0	ug/Kg		
Chlorobenzene	<6.0	ug/Kg		
Chloroethane	<6.0	ug/Kg		
2-Chloroethylvinyl ether	<6.0	ug/Kg		
Chloroform	<6.0	ug/Kg		
Chloromethane	<6.0	ug/Kg		
Dibromochloromethane	<6.0	ug/Kg		
1,2-Dichlorobenzene	<6.0	ug/Kg		
1,3-Dichlorobenzene	<6.0	ug/Kg		
1,4-Dichlorobenzene	<6.0	ug/Kg		
1,1-Dichloroethane	<6.0	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg		
1,1-Dichloroethene	<6.0	ug/Kg		
trans-1,2-Dichloroethene	<6.0	ug/Kg		
1,2-Dichloropropane	<6.0	ug/Kg		
cis-1,3-Dichloropropene	<6.0	ug/Kg		
trans-1,3-Dichloropropene	<6.0	ug/Kg		
Ethylbenzene	<6.0	ug/Kg		
2-Hexanone	<6.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
Methylene Chloride	<6.0	ug/Kg		
Styrene	<6.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg		
Tetrachloroethene	<6.0	ug/Kg		
Toluene	<6.0	ug/Kg		
1,1,1-Trichloroethane	<6.0	ug/Kg		
1,1,2-Trichloroethane	<6.0	ug/Kg		
Trichloroethene	<6.0	ug/Kg		
Trichlorofluoromethane	<6.0	ug/Kg		
Vinyl Acetate	<6.0	ug/Kg		
Vinyl Chloride	<6.0	ug/Kg		
m-Xylene	<6.0	ug/Kg		
o-Xylene	<6.0	ug/Kg		
p-Xylene	<6.0	ug/Kg		

NET

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34112

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/25/1992

Sample ID: CV-92-334-156

NET Sample No: 67140

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<6.0	ug/Kg	09/29/1992	dry
Benzene	<6.0	ug/Kg		
Bromodichloromethane	<6.0	ug/Kg		
Bromoform	<6.0	ug/Kg		
Bromomethane	<6.0	ug/Kg		
2-Butanone (MEK)	<6.0	ug/Kg		
Carbon Disulfide	<6.0	ug/Kg		
Carbon Tetrachloride	<6.0	ug/Kg		
Chlorobenzene	<6.0	ug/Kg		
Chloroethane	<6.0	ug/Kg		
2-Chloroethylvinyl ether	<6.0	ug/Kg		
Chloroform	<6.0	ug/Kg		
Chloromethane	<6.0	ug/Kg		
Dibromochloromethane	<6.0	ug/Kg		
1,2-Dichlorobenzene	<6.0	ug/Kg		
1,3-Dichlorobenzene	<6.0	ug/Kg		
1,4-Dichlorobenzene	<6.0	ug/Kg		
1,1-Dichloroethane	<6.0	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg		
1,1-Dichloroethene	<6.0	ug/Kg		
trans-1,2-Dichloroethene	<6.0	ug/Kg		
1,2-Dichloropropane	<6.0	ug/Kg		
cis-1,3-Dichloropropene	<6.0	ug/Kg		
trans-1,3-Dichloropropene	<6.0	ug/Kg		
Ethylbenzene	<6.0	ug/Kg		
2-Hexanone	<6.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
Methylene Chloride	<6.0	ug/Kg		
Styrene	<6.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg		
Tetrachloroethene	<6.0	ug/Kg		
Toluene	<6.0	ug/Kg		
1,1,1-Trichloroethane	<6.0	ug/Kg		
1,1,2-Trichloroethane	<6.0	ug/Kg		
Trichloroethene	<6.0	ug/Kg		
Trichlorofluoromethane	<6.0	ug/Kg		
Vinyl Acetate	<6.0	ug/Kg		
Vinyl Chloride	<6.0	ug/Kg		
m-Xylene	<6.0	ug/Kg		
o-Xylene	<6.0	ug/Kg		
p-Xylene	<6.0	ug/Kg		

NET

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34112

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/25/1992

Sample ID: CV-92-336-I113

NET Sample No: 67141

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<5.0	ug/Kg	09/29/1992	dry
Benzene	<5.0	ug/Kg		
Bromodichloromethane	<5.0	ug/Kg		
Bromoform	<5.0	ug/Kg		
Bromomethane	<5.0	ug/Kg		
2-Butanone (MEK)	<5.0	ug/Kg		
Carbon Disulfide	<5.0	ug/Kg		
Carbon Tetrachloride	<5.0	ug/Kg		
Chlorobenzene	<5.0	ug/Kg		
Chloroethane	<5.0	ug/Kg		
2-Chloroethylvinyl ether	<5.0	ug/Kg		
Chloroform	<5.0	ug/Kg		
Chloromethane	<5.0	ug/Kg		
Dibromochloromethane	<5.0	ug/Kg		
1,2-Dichlorobenzene	<5.0	ug/Kg		
1,3-Dichlorobenzene	<5.0	ug/Kg		
1,4-Dichlorobenzene	<5.0	ug/Kg		
1,1-Dichloroethane	<5.0	ug/Kg		
1,2-Dichloroethane	<5.0	ug/Kg		
1,1-Dichloroethene	<5.0	ug/Kg		
trans-1,2-Dichloroethene	<5.0	ug/Kg		
1,2-Dichloropropane	<5.0	ug/Kg		
cis-1,3-Dichloropropene	<5.0	ug/Kg		
trans-1,3-Dichloropropene	<5.0	ug/Kg		
Ethylbenzene	<5.0	ug/Kg		
2-Hexanone	<5.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<5.0	ug/Kg		
Methylene Chloride	<5.0	ug/Kg		
Styrene	<5.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg		
Tetrachloroethene	<5.0	ug/Kg		
Toluene	<5.0	ug/Kg		
1,1,1-Trichloroethane	<5.0	ug/Kg		
1,1,2-Trichloroethane	<5.0	ug/Kg		
Trichloroethene	<5.0	ug/Kg		
Trichlorofluoromethane	<5.0	ug/Kg		
Vinyl Acetate	<5.0	ug/Kg		
Vinyl Chloride	<5.0	ug/Kg		
m-Xylene	<5.0	ug/Kg		
o-Xylene	<5.0	ug/Kg		
p-Xylene	<5.0	ug/Kg		

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 09/30/1992

Report To: ICF Kaiser Engineers — NET Job No: 92.34112

Project: PPG RUSH SOIL VOAs — Date Rec'd: 09/25/1992

Sample ID: CV-92-358-FBI

NET Sample No: 67142

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 624 AQ				
Acetone	<5.0	ug/L	09/29/1992	cdl
Benzene	<5.0	ug/L		
Bromodichloromethane	<5.0	ug/L		
Bromoform	<5.0	ug/L		
Bromomethane	<5.0	ug/L		
2-Butanone (MEK)	<5.0	ug/L		
Carbon Disulfide	<5.0	ug/L		
Carbon Tetrachloride	<5.0	ug/L		
Chlorobenzene	<5.0	ug/L		
Chloroethane	<5.0	ug/L		
2-Chloroethylvinyl ether	<5.0	ug/L		
Chloroform	<5.0	ug/L		
Chloromethane	<5.0	ug/L		
Dibromochloromethane	<5.0	ug/L		
1,2-Dichlorobenzene	<5.0	ug/L		
1,3-Dichlorobenzene	<5.0	ug/L		
1,4-Dichlorobenzene	<5.0	ug/L		
1,1-Dichloroethane	<5.0	ug/L		
1,2-Dichloroethane	<5.0	ug/L		
1,1-Dichloroethene	<5.0	ug/L		
trans-1,2-Dichloroethene	<5.0	ug/L		
1,2-Dichloropropane	<5.0	ug/L		
cis-1,3-Dichloropropene	<5.0	ug/L		
trans-1,3-Dichloropropene	<5.0	ug/L		
Ethylbenzene	<5.0	ug/L		
2-Hexanone	<5.0	ug/L		
4-Methyl-2-pentanone (MIBK	<5.0	ug/L		
Methylene Chloride	<5.0	ug/L		
Styrene	<5.0	ug/L		
1,1,2,2-Tetrachloroethane	<5.0	ug/L		
Tetrachloroethene	<5.0	ug/L		
Toluene	<5.0	ug/L		
1,1,1-Trichloroethane	<5.0	ug/L		
1,1,2-Trichloroethane	<5.0	ug/L		
Trichloroethene	<5.0	ug/L		
Trichlorofluoromethane	<5.0	ug/L		
Vinyl Acetate	<5.0	ug/L		
Vinyl Chloride	<5.0	ug/L		
m-Xylene	<5.0	ug/L		
o-Xylene	<5.0	ug/L		
p-Xylene	<5.0	ug/L		

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 09/30/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34112

Project: PPG RUSH SOIL VOAs

Date Rec'd: 09/25/1992

Sample ID: CV-92-360-S146

NET Sample No: 67143

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<5.0	ug/Kg	09/29/1992	dry
Benzene	<5.0	ug/Kg		
Bromodichloromethane	<5.0	ug/Kg		
Bromoform	<5.0	ug/Kg		
Bromomethane	<5.0	ug/Kg		
2-Butanone (MEK)	<5.0	ug/Kg		
Carbon Disulfide	<5.0	ug/Kg		
Carbon Tetrachloride	<5.0	ug/Kg		
Chlorobenzene	<5.0	ug/Kg		
Chloroethane	<5.0	ug/Kg		
2-Chloroethylvinyl ether	<5.0	ug/Kg		
Chloroform	<5.0	ug/Kg		
Chloromethane	<5.0	ug/Kg		
Dibromochloromethane	<5.0	ug/Kg		
1,2-Dichlorobenzene	<5.0	ug/Kg		
1,3-Dichlorobenzene	<5.0	ug/Kg		
1,4-Dichlorobenzene	<5.0	ug/Kg		
1,1-Dichloroethane	<5.0	ug/Kg		
1,2-Dichloroethane	<5.0	ug/Kg		
1,1-Dichloroethene	<5.0	ug/Kg		
trans-1,2-Dichloroethene	<5.0	ug/Kg		
1,2-Dichloropropane	<5.0	ug/Kg		
cis-1,3-Dichloropropene	<5.0	ug/Kg		
trans-1,3-Dichloropropene	<5.0	ug/Kg		
Ethylbenzene	<5.0	ug/Kg		
2-Hexanone	<5.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<5.0	ug/Kg		
Methylene Chloride	<5.0	ug/Kg		
Styrene	<5.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg		
Tetrachloroethene	<5.0	ug/Kg		
Toluene	<5.0	ug/Kg		
1,1,1-Trichloroethane	<5.0	ug/Kg		
1,1,2-Trichloroethane	<5.0	ug/Kg		
Trichloroethene	<5.0	ug/Kg		
Trichlorofluoromethane	<5.0	ug/Kg		
Vinyl Acetate	<5.0	ug/Kg		
Vinyl Chloride	<5.0	ug/Kg		
m-Xylene	<5.0	ug/Kg		
o-Xylene	<5.0	ug/Kg		
p-Xylene	<5.0	ug/Kg		

NET

NET Cambridge Division

QUALITY CONTROL DATA

Client: ICF Kaiser Engineers NET Job No: 92.34096

Project: PPG RUSH SOIL VOAs Report Date: 09/30/1992

Surrogate Standard Percent Recovery

Abbreviated Surrogate Standard Names:

SS1	SS2	SS3	SS4	SS5	SS6	SS7	SS8	SS9	SS10	SS11	SS12
Bromofl	1,2-Dic	Toluene	Bromofl	1,2-Dic	Toluene						

						Percent Recovery								
Sample ID	NET ID	Matrix	SS1	SS2	SS3	SS4	SS5	SS6	SS7	SS8	SS9	SS10	SS11	SS12
CV-92-350-S79	67046	SOIL				87	83	107						
CV-92-354-S152	67047	SOIL				80	76	117						
CV-92-340-W45	67048	SOIL				95	88	112						
CV-92-342-W51	67049	SOIL				87	84	128						
CV-92-344-W56	67050	SOIL				75	76	109						
CV-92-346-W60	67051	SOIL				78	74	107						
CV-92-347-W60A	67052	SOIL				94	91	126						
CV-92-351-FBW	67053	BLANK	104	99	106									
CV-92-330-I34	67138	SOIL				87	84	107						
CV-92-332-I36	67139	SOIL				81	83	109						
CV-92-334-I56	67140	SOIL				82	82	105						
CV-92-336-I113	67141	SOIL				85	78	104						
CV-92-358-FBI	67142	BLANK	101	100	106									
CV-92-360-S146	67143	SOIL				87	82	102						

Notes:
NR - This surrogate standard is Not Required. Other versions of this test method may use this surrogate standard.
Dil - This surrogate standard was diluted to below detectable levels due to concentrations of analytes in this sample.

Complete Surrogate Standard Names Listed by Analysis:

Pesticide Surrogate Standards:
Decachl = Decachlorobiphenyl Dibutyl = Dibutylchlorendate Tetrach = Tetrachloro-m-xylene

Volatile Surrogate Standards:
Bromofl = Bromofluorobenzene 1,2-Dichl = 1,2-Dichloroethane-d4 Toluene = Toluene-d8

Drinking Water Method 524 1,2-Dichl = 1,2-Dichlorobenzene-d4

Semivolatlile Surrogate Standards:
2-Fluor (1st) = 2-Fluorobiphenyl Phenol- = Phenol-d6 2,4,6-T = 2,4,6-Tribromophenol
2-Fluor (2nd) = 2-Fluorophenol Nitrobe = Nitrobenzene-d5 p-Terph = p-Terphenyl

Herbicides Surrogate Standard:
2,4-Dic = 2,4-Dichlorophenyl acetic acid

Petroleum Hydrocarbon Fingerprint Surrogate Standard:
2-Fluor = 2-Fluorobiphenyl para-Te = para-Terphynyl

NET

NET ATLANTIC, INC. CAMBRIDGE DIVISION
DATA WORKSHEET METHOD BLANK

DATE/TIME:920925 11:46 ANALYST:JP INSTRUMENT:HP5970
BLANK FILE: >H4112
MATRIX: SOIL ✓ AQUEOUS ____ MEDIUM LEVEL ____.

TEST	COMPOUND NAME	RESULT U6/L	RESULT U6/K6	REPORTING LIMIT U6/L	REPORTING LIMIT U6/K6
56644	CHLOROMETHANE	......	ND	5	
56628	BROMOMETHANE	......		5	
56692	VINYL CHLORIDE	......		5	
56638	CHLOROETHANE	......		5	
56689	TRICHLOROFLUOROMETHANE	......		5	
56672	METHYLENE CHLORIDE	......		5	
56620	ACETONE	......		5	
56632	CARBON DISULFIDE	......		5	
56652	1,1-DICHLOROETHANE	......		5	
56656	1,1-DICHLOROETHENE	......		5	
56658	trans-1,2-DICHLOROETHENE	......		5	
	cis-1,2-DICHLOROETHENE			5	
56642	CHLOROFORM	......		5	
56654	1,2-DICHLOROETHANE	......		5	
56630	2-BUTANONE (MEK)	......		5	
56692	1,1,1-TRICHLOROETHANE	......		5	
56634	CARBON TETRACHLORIDE	......		5	
55690	VINYL ACETATE	......		5	
56624	BROMODICHLOROMETHANE	......		5	
56660	1,2-DICHLOROPROPANE	......		5	
56665	TRICHLOROETHENE	......		5	
56646	DIBROMOCHLOROMETHANE	......		5	
56664	1,1,2-TRICHLOROETHANE	......		5	
56622	BENZENE	......		5	
56664	trans-1,3-DICHLOROPROPENE	......		5	
	cis-1,3-DICHLOROPROPENE	......		5	
56540	2-CHLOROETHYLVINYL ETHER	......		5	
55626	BROMOFORM	......		5	
56570	4-METHYL-2-PENTANONE	......		5	
56662	2-HEXANONE	......		5	
56676	TETRACHLOROETHENE	......		5	
55676	1,1,2,2-TETRACHLOROETHANE	......		5	
56680	TOLUENE	......		5	
56636	CHLOROBENZENE	......		5	
56566	ETHYLBENZENE	......		5	
56674	STYRENE	......		5	
56694	m-XYLENE	......		5	
56696	o-XYLENE	......		5	
56697	p-XYLENE	......		5	
	TOTAL XYLENES	......		5	
56549	1,2-DICHLOROBENZENE	......		5	
56550	1,3-DICHLOROBENZENE	......		5	
56551	1,4-DICHLOROBENZENE	......		5	

SURROGATE COMPOUND RECOVERIES	%	SOIL LIMITS	AQUEOUS LIMITS
SS1 D4-DICHLOROETHANE	90	70-121%	76-114%
SS2 D8-TOLUENE	103	84-138%	88-110%
SS3 BROMOFLUOROBENZENE	95	59-113%	86-115%

NET ATLANTIC, INC CAMBRIDGE DIVISION
DATA WORKSHEET METHOD BLANK

DATE/TIME:920925 18:23 ANALYST:MANAGER INSTRUMENT:HP5970
BLANK FILE: >H4120
MATRIX: SOIL ✓ AQUEOUS ______ MEDIUM LEVEL ______.

TEST	COMPOUND NAME	RESULT UG/L	RESULT UG/KG	REPORTING LIMIT UG/L	REPORTING LIMIT UG/KG
56644	CHLOROMETHANE	......	ND	5	
56628	BROMOMETHANE	......		5	
56692	VINYL CHLORIDE	......		5	
56638	CHLOROETHANE	......		5	
56688	TRICHLOROFLUOROMETHANE	......		5	
56672	METHYLENE CHLORIDE	......		5	
56620	ACETONE	......		5	
56632	CARBON DISULFIDE	......		5	
56652	1,1-DICHLOROETHANE	......		5	
56656	1,1-DICHLOROETHENE	......		5	
56658	trans-1,2-DICHLOROETHENE	......		5	
	cis-1,2-DICHLOROETHENE			5	
56642	CHLOROFORM	......		5	
56654	1,2-DICHLOROETHANE	......		5	
56630	2-BUTANONE (MEK)	......		5	
56662	1,1,1-TRICHLOROETHANE	......		5	
56634	CARBON TETRACHLORIDE	......		5	
56690	VINYL ACETATE	......		5	
56624	BROMODICHLOROMETHANE	......		5	
56660	1,2-DICHLOROPROPANE	......		5	
56686	TRICHLOROETHENE	......		5	
56646	DIBROMOCHLOROMETHANE	......		5	
56664	1,1,2-TRICHLOROETHANE	......		5	
56622	BENZENE	......		5	
56664	trans-1,3-DICHLOROPROPENE	......		5	
	cis-1,3-DICHLOROPROPENE	......		5	
56640	2-CHLOROETHYLVINYL ETHER	......		5	
56626	BROMOFORM	......		5	
56670	4-METHYL-2-PENTANONE	......		5	
56668	2-HEXANONE	......		5	
56676	TETRACHLOROETHENE	......		5	
56675	1,1,2,2-TETRACHLOROETHANE	......		5	
56680	TOLUENE	......		5	
56636	CHLOROBENZENE	......		5	
56666	ETHYLBENZENE	......		5	
56674	STYRENE	......		5	
56694	m-XYLENE	......		5	
56696	o-XYLENE	......		5	
56697	p-XYLENE	......		5	
	TOTAL XYLENES	......		5	
56648	1,2-DICHLOROBENZENE	......		5	
56650	1,3-DICHLOROBENZENE	......		5	
56651	1,4-DICHLOROBENZENE	......		5	

SURROGATE COMPOUND RECOVERIES	%	SOIL LIMITS	AQUEOUS LIMITS
SS1 D4-DICHLOROETHANE	75	70-121%	76-114%
SS2 D8-TOLUENE	96	84-138%	88-110%
SS3 BROMOFLUOROBENZENE	92	59-113%	86-115%

NET

NET ATLANTIC, INC CAMBRIDGE DIVISION
DATA WORKSHEET METHOD BLANK

DATE/TIME:920929 12:32 ANALYST:JIM INSTRUMENT:HP5970
BLANK FILE: >E0178
MATRIX: SOIL ______ AQUEOUS __X__ MEDIUM LEVEL ______.

TEST	COMPOUND NAME	RESULT UG/L	RESULT UG/KG	REPORTING LIMIT UG/L	REPORTING LIMIT UG/KG
56644	CHLOROMETHANE	......		5	
56628	BROMOMETHANE	......		5	
56692	VINYL CHLORIDE	......		5	
56638	CHLOROETHANE	......		5	
56688	TRICHLOROFLUOROMETHANE	......		5	
56672	METHYLENE CHLORIDE	......		5	
56620	ACETONE	......		5	
56632	CARBON DISULFIDE	......		5	
56652	1,1-DICHLOROETHANE	......		5	
56656	1,1-DICHLOROETHENE	......		5	
56658	trans-1,2-DICHLOROETHENE	......		5	
	cis-1,2-DICHLOROETHENE			5	
56642	CHLOROFORM	......		5	
56654	1,2-DICHLOROETHANE	......		5	
56630	2-BUTANONE (MEK)	......		5	
56682	1,1.1-TRICHLOROETHANE	......		5	
56634	CARBON TETRACHLORIDE	......		5	
56690	VINYL ACETATE	......		5	
56624	BROMODICHLOROMETHANE	......		5	
56660	1,2-DICHLOROPROPANE	......		5	
56686	TRICHLOROETHENE	......		5	
56646	DIBROMOCHLOROMETHANE	......		5	
56684	1,1,2-TRICHLOROETHANE	......		5	
56622	BENZENE	1		5	
56664	trans-1,3-DICHLOROPROPENE	......		5	
	cis-1,3-DICHLOROPROPENE	......		5	
56640	2-CHLOROETHYLVINYL ETHER	......		5	
56626	BROMOFORM	......		5	
56670	4-METHYL-2-PENTANONE	......		5	
56668	2-HEXANONE	......		5	
56678	TETRACHLOROETHENE	......		5	
56676	1,1,2,2-TETRACHLOROETHANE	1		5	
56680	TOLUENE	......		5	
56636	CHLOROBENZENE	......		5	
56666	ETHYLBENZENE	......		5	
56674	STYRENE	......		5	
56694	m-XYLENE	......		5	
56696	o-XYLENE	......		5	
56697	p-XYLENE	......		5	
	TOTAL XYLENES	......		5	
56648	1.2-DICHLOROBENZENE	......		5	
56650	1,3-DICHLOROBENZENE	......		5	
56651	1,4-DICHLOROBENZENE	......		5	

SURROGATE COMPOUND RECOVERIES	%	SOIL LIMITS	AQUEOUS L
951 D4-DICHLOROETHANE	99	70-121%	76-114%
952 D8-TOLUENE	104	84-138%	88-110%
953 BROMOFLUOROBENZENE	101	59-113%	86-115%

NET

8787

NET ATLANTIC, INC CAMBRIDGE DIVISION
DATA WORKSHEET METHOD BLANK

DATE/TIME: 920929 16:06   ANALYST: JIM   INSTRUMENT: HP5970
BLANK FILE: >E0181
MATRIX: SOIL ______ AQUEOUS __✓__ MEDIUM LEVEL ______.

TEST	COMPOUND NAME	RESULT UG/L	RESULT UG/KG	REPORTING LIMIT UG/L	REPORTING LIMIT UG/KG
56644	CHLOROMETHANE	......	ND	5	
56628	BROMOMETHANE	......		5	
56692	VINYL CHLORIDE	......		5	
56638	CHLOROETHANE	......		5	
56688	TRICHLOROFLUOROMETHANE	......		5	
56672	METHYLENE CHLORIDE	......		5	
56620	ACETONE	......		5	
56632	CARBON DISULFIDE	......		5	
56652	1,1-DICHLOROETHANE	......		5	
56656	1,1-DICHLOROETHENE	......		5	
56658	trans-1,2-DICHLOROETHENE	......		5	
	cis-1,2-DICHLOROETHENE			5	
56642	CHLOROFORM	......		5	
56654	1,2-DICHLOROETHANE	......		5	
56630	2-BUTANONE (MEK)	......		5	
56682	1,1,1-TRICHLOROETHANE	......		5	
56634	CARBON TETRACHLORIDE	......		5	
56590	VINYL ACETATE	......		5	
56624	BROMODICHLOROMETHANE	......		5	
56660	1,2-DICHLOROPROPANE	......		5	
56686	TRICHLOROETHENE	......		5	
56646	DIBROMOCHLOROMETHANE	......		5	
56684	1,1,2-TRICHLOROETHANE	......		5	
56622	BENZENE	......		5	
56664	trans-1,3-DICHLOROPROPENE	......		5	
	cis-1,3-DICHLOROPROPENE	......		5	
56640	2-CHLOROETHYLVINYL ETHER	......		5	
56626	BROMOFORM	......		5	
56670	4-METHYL-2-PENTANONE	......		5	
56668	2-HEXANONE	......		5	
56578	TETRACHLOROETHENE	......		5	
56676	1,1,2,2-TETRACHLOROETHANE	......		5	
56680	TOLUENE	......		5	
56636	CHLOROBENZENE	......		5	
56666	ETHYLBENZENE	......		5	
56674	STYRENE	......		5	
55694	m-XYLENE	......		5	
56696	o-XYLENE	......		5	
56697	p-XYLENE	......		5	
	TOTAL XYLENES	......		5	
56648	1,2-DICHLOROBENZENE	......		5	
56650	1,3-DICHLOROBENZENE	......		5	
56651	1,4-DICHLOROBENZENE	......		5	

SURROGATE COMPOUND RECOVERIES	%	SOIL LIMITS	AQUEOUS LIMITS
SS1 D4-DICHLOROETHANE	99	70-121%	76-114%
SS2 D8-TOLUENE	102	84-138%	88-110%
SS3 BROMOFLUOROBENZENE	97	59-113%	86-115%

NET

NET ATLANTIC, INC - CAMBRIDGE DIVISION
DATA WORKSHEET METHOD BLANK

DATE/TIME:920929 16:01 ANALYST:JP INSTRUMENT:HP5970
BLANK FILE: >H4140
MATRIX: SOIL ✓ AQUEOUS ______ MEDIUM LEVEL _____.

TEST	COMPOUND NAME	RESULT UG/L	RESULT UG/KG	REPORTING LIMIT UG/L	REPORTING LIMIT UG/KG
56644	CHLOROMETHANE	......	ND	5	
56628	BROMOMETHANE	......		5	
56692	VINYL CHLORIDE	......		5	
56638	CHLOROETHANE	......		5	
56668	TRICHLOROFLUOROMETHANE	......		5	
56672	METHYLENE CHLORIDE	......		5	
56620	ACETONE	......		5	
56632	CARBON DISULFIDE	......		5	
56652	1,1-DICHLOROETHANE	......		5	
56656	1,1-DICHLOROETHENE	......		5	
56658	trans-1,2-DICHLOROETHENE	......		5	
	cis-1,2-DICHLOROETHENE			5	
56642	CHLOROFORM	......		5	
56654	1,2-DICHLOROETHANE	......		5	
56630	2-BUTANONE (MEK)	......		5	
56662	1,1,1-TRICHLOROETHANE	......		5	
56634	CARBON TETRACHLORIDE	......		5	
56690	VINYL ACETATE	......		5	
56624	BROMODICHLOROMETHANE	......		5	
56660	1,2-DICHLOROPROPANE	......		5	
56686	TRICHLOROETHENE	......		5	
56646	DIBROMOCHLOROMETHANE	......		5	
56664	1,1,2-TRICHLOROETHANE	......		5	
56622	BENZENE	......		5	
56684	trans-1,3-DICHLOROPROPENE	......		5	
	cis-1,3-DICHLOROPROPENE	......		5	
56640	2-CHLOROETHYLVINYL ETHER	......		5	
56626	BROMOFORM	......		5	
56670	4-METHYL-2-PENTANONE	......		5	
56658	2-HEXANONE	......		5	
56678	TETRACHLOROETHENE	......		5	
56676	1,1,2,2-TETRACHLOROETHANE	......		5	
56680	TOLUENE	......		5	
56636	CHLOROBENZENE	......		5	
56666	ETHYLBENZENE	......		5	
56674	STYRENE	......		5	
56694	m-XYLENE	......		5	
56696	o-XYLENE	......		5	
56697	p-XYLENE	......		5	
	TOTAL XYLENES	......		5	
56648	1,2-DICHLOROBENZENE	......		5	
56650	1,3-DICHLOROBENZENE	......		5	
56651	1,4-DICHLOROBENZENE	......		5	

SURROGATE COMPOUND RECOVERIES	%	SOIL LIMITS	AQUEOUS LIMITS
SS1 D4-DICHLOROETHANE	81	70-121%	76-114%
SS2 D8-TOLUENE	90	84-138%	88-110%
SS3 BROMOFLUOROBENZENE	87	59-113%	86-115%

NET

NET ATLANTIC, INC CAMBRIDGE DIVISION
DATA WORKSHEET METHOD BLANK

DATE/TIME:920929 23:40 ANALYST:JP INSTRUMENT:HP5970

BLANK FILE: >H4149

MATRIX: SOIL ✓ AQUEOUS ______ MEDIUM LEVEL ______.

TEST	COMPOUND NAME	RESULT UG/L	RESULT UG/KG	REPORTING LIMIT UG/L	REPORTING LIMIT UG/KG
56644	CHLOROMETHANE	......	ND	5	
56628	BROMOMETHANE	......		5	
56692	VINYL CHLORIDE	......		5	
56636	CHLOROETHANE	......		5	
56688	TRICHLOROFLUOROMETHANE	......		5	
56672	METHYLENE CHLORIDE	......		5	
56620	ACETONE	......		5	
56632	CARBON DISULFIDE	......		5	
56652	1,1-DICHLOROETHANE	......		5	
56656	1,1-DICHLOROETHENE	......		5	
56658	trans-1,2-DICHLOROETHENE	......		5	
	cis-1,2-DICHLOROETHENE			5	
56642	CHLOROFORM	......		5	
56654	1,2-DICHLOROETHANE	......		5	
56630	2-BUTANONE (MEK)	......		5	
56662	1,1,1-TRICHLOROETHANE	......		5	
56634	CARBON TETRACHLORIDE	......		5	
56690	VINYL ACETATE	......		5	
56624	BROMODICHLOROMETHANE	......		5	
56660	1,2-DICHLOROPROPANE	......		5	
56686	TRICHLOROETHENE	......		5	
56646	DIBROMOCHLOROMETHANE	......		5	
56684	1,1,2-TRICHLOROETHANE	......		5	
56622	BENZENE	......		5	
56664	trans-1,3-DICHLOROPROPENE	......		5	
	cis-1,3-DICHLOROPROPENE	......		5	
56640	2-CHLOROETHYLVINYL ETHER	......		5	
56626	BROMOFORM	......		5	
56670	4-METHYL-2-PENTANONE	......		5	
56668	2-HEXANONE	......		5	
56678	TETRACHLOROETHENE	......		5	
56676	1,1,2,2-TETRACHLOROETHANE	......		5	
56680	TOLUENE	......		5	
56636	CHLOROBENZENE	......		5	
56666	ETHYLBENZENE	......		5	
56674	STYRENE	......		5	
56694	m-XYLENE	......		5	
56696	o-XYLENE	......		5	
56697	p-XYLENE	......		5	
	TOTAL XYLENES	......		5	
56648	1,2-DICHLOROBENZENE	......		5	
56650	1,3-DICHLOROBENZENE	......		5	
56651	1,4-DICHLOROBENZENE	......		5	

SURROGATE COMPOUND RECOVERIES	%	SOIL LIMITS	AQUEOUS LIMITS
SS1 D4-DICHLOROETHANE	79	70-121%	76-114%
SS2 D8-TOLUENE	103	84-138%	88-110%
SS3 BROMOFLUOROBENZENE	94	59-113%	86-115%

NET

NET ATLANTIC, INC CAMBRIDGE DIVISION
DATA WORKSHEET METHOD BLANK

DATE/TIME:920930 10:19 ANALYST:MARK INSTRUMENT:HP59 70
BLANK FILE: >G8038
MATRIX: SOIL ______ AQUEOUS ✓ MEDIUM LEVEL ______.

TEST	COMPOUND NAME	RESULT UG/L	RESULT UG/KG	REPORTING LIMIT UG/L	REPORTING LIMIT UG/KG
56644	CHLOROMETHANE	......		5	
56628	BROMOMETHANE	......		5	
56692	VINYL CHLORIDE	......		5	
56638	CHLOROETHANE	......		5	
56688	TRICHLOROFLUOROMETHANE	......		5	
56672	METHYLENE CHLORIDE	......		5	
56620	ACETONE	...7..		5	
56632	CARBON DISULFIDE	......		5	
56652	1,1-DICHLOROETHANE	......		5	
56656	1,1-DICHLOROETHENE	......		5	
56658	trans-1,2-DICHLOROETHENE	......		5	
	cis-1,2-DICHLOROETHENE	......		5	
56642	CHLOROFORM	......		5	
56654	1,2-DICHLOROETHANE	......		5	
56630	2-BUTANONE (MEK)	......		5	
56682	1,1,1-TRICHLOROETHANE	......		5	
56634	CARBON TETRACHLORIDE	......		5	
56690	VINYL ACETATE	......		5	
56624	BROMODICHLOROMETHANE	......		5	
56660	1,2-DICHLOROPROPANE	......		5	
56686	TRICHLOROETHENE	......		5	
56646	DIBROMOCHLOROMETHANE	......		5	
56684	1,1,2-TRICHLOROETHANE	......		5	
56622	BENZENE	......		5	
56664	trans-1,3-DICHLOROPROPENE	......		5	
	cis-1,3-DICHLOROPROPENE	......		5	
56640	2-CHLOROETHYLVINYL ETHER	......		5	
56626	BROMOFORM	......		5	
56670	4-METHYL-2-PENTANONE	......		5	
56668	2-HEXANONE	......		5	
56678	TETRACHLOROETHENE	......		5	
56676	1,1,2,2-TETRACHLOROETHANE	...1..		5	
56680	TOLUENE	......		5	
56636	CHLOROBENZENE	......		5	
56666	ETHYLBENZENE	......		5	
56674	STYRENE	......		5	
56694	m-XYLENE	......		5	
56696	o-XYLENE	......		5	
56697	p-XYLENE	......		5	
	TOTAL XYLENES	......		5	
56648	1,2-DICHLOROBENZENE	......		5	
56650	1,3-DICHLOROBENZENE	......		5	
56651	1,4-DICHLOROBENZENE	......		5	

SURROGATE COMPOUND RECOVERIES	%	SOIL LIMITS	AQUEOUS L:
[illegible] D4-DICHLOROETHANE	..95...	70-121%	76-11[illegible]%
[illegible] D8-TOLUENE	..97...	84-138%	88-110%
[illegible] BROMOFLUOROBENZENE	..100..	59-11[illegible]%	86-1[illegible]%

NET

NET ATLANTIC, INC CAMBRIDGE DIVISION
DATA WORKSHEET METHOD BLANK

DATE/TIME:920930 13:35 ANALYST:MARK INSTRUMENT:HP59 70
BLANK FILE: >G8042
MATRIX: SOIL ______ AQUEOUS ✓ MEDIUM LEVEL ______.

TEST	COMPOUND NAME	RESULT UG/L	RESULT UG/KG	REPORTING LIMIT UG/L	REPORTING LIMIT UG/KG
56644	CHLOROMETHANE	......	ND	5	
56628	BROMOMETHANE	......		5	
56692	VINYL CHLORIDE	......		5	
56638	CHLOROETHANE	......		5	
56688	TRICHLOROFLUOROMETHANE	......		5	
56672	METHYLENE CHLORIDE	......		5	
56620	ACETONE	......		5	
56632	CARBON DISULFIDE	......		5	
56652	1,1-DICHLOROETHANE	......		5	
56656	1,1-DICHLOROETHENE	......		5	
56658	trans-1,2-DICHLOROETHENE	......		5	
	cis-1,2-DICHLOROETHENE	......		5	
56642	CHLOROFORM	......		5	
56654	1,2-DICHLOROETHANE	......		5	
56630	2-BUTANONE (MEK)	......		5	
56682	1,1,1-TRICHLOROETHANE	......		5	
56634	CARBON TETRACHLORIDE	......		5	
56690	VINYL ACETATE	......		5	
56624	BROMODICHLOROMETHANE	......		5	
56660	1,2-DICHLOROPROPANE	......		5	
56686	TRICHLOROETHENE	......		5	
56646	DIBROMOCHLOROMETHANE	......		5	
56684	1,1,2-TRICHLOROETHANE	......		5	
56622	BENZENE	......		5	
56664	trans-1,3-DICHLOROPROPENE	......		5	
	cis-1,3-DICHLOROPROPENE	......		5	
56640	2-CHLOROETHYLVINYL ETHER	......		5	
56626	BROMOFORM	......		5	
56670	4-METHYL-2-PENTANONE	......		5	
56668	2-HEXANONE	......		5	
56678	TETRACHLOROETHENE	......		5	
56676	1,1,2,2-TETRACHLOROETHANE	......		5	
56680	TOLUENE	......		5	
56636	CHLOROBENZENE	......		5	
56666	ETHYLBENZENE	......		5	
56674	STYRENE	......		5	
56694	m-XYLENE	......		5	
56696	o-XYLENE	......		5	
56697	p-XYLENE	......		5	
	TOTAL XYLENES	......		5	
56648	1,2-DICHLOROBENZENE	......		5	
56650	1,3-DICHLOROBENZENE	......		5	
56651	1,4-DICHLOROBENZENE	......		5	

SURROGATE COMPOUND RECOVERIES	%	SOIL LIMITS	AQUEOUS L
SS1 D4-DICHLOROETHANE	..101...	70-121%	76-114%
SS2 D8-TOLUENE	..102...	84-138%	88-110%
SS3 BROMOFLUOROBENZENE	..105...	59-113%	86-115%

NET

ND

9-29-92 H
8253

NET CAMBRIDGE

SOIL VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

JOB NO. 92.34112 SAMPLE NO. 67139

- FILE Kaiser

COMPOUNDS	SPIKE ADDED (UG/Kg)	SAMPLE CONCENTRATION (UG/Kg)	MS CONCENTRATION (UG/Kg)	MS % REC.	QC LIMITS REC
1,1-DICHLOROETHENE..	50	0.0	39.9	79.8	59-172
TRICHLOROETHENE.....	50	0.0	38.9	77.8	62-137
BENZENE.............	50	0.0	44.8	89.6	66-142
TOLUENE.............	50	0.0	47.4	94.8	59-139
CHLOROBENZENE.......	50	0.0	42.6	85.2	60-133

FILE

COMPOUNDS	SPIKE ADDED (UG/Kg)	MSD CONCENTRATION (UG/Kg)	MSD % REC.	% RPD.	QC LIMITS % RPD	QC LIMITS % REC
1,1-DICHLOROETHENE..	50	43.7	87.3	9	22	59-172
TRICHLOROETHENE.....	50	41.3	82.5	6	24	62-137
BENZENE.............	50	47.3	94.5	5	21	66-142
TOLUENE.............	50	51.3	102.6	8	21	59-139
CHLOROBENZENE.......	50	45.1	90.2	6	21	60-133

(%RPD FOR COMM. <= 25%)

VALUES OUTSIDE OF QC LIMITS

RPD: 0 OUT OF 5 OUTSIDE LIMITS

SPIKE RECOVERY: 0 OUT OF 10 OUTSIDE OF LIMITS

COMMENTS:

3/90

NET

92.34096
92.34098

CHAIN OF CUSTODY RECORD

PROJECT NAME PPG CIRCLEVILLE
COMPANY ICF KAISER ENGINEERS
ADDRESS 4 Gateway Center Pittsburgh PA 15222
PHONE (412) 497-2385

NET NATIONAL ENVIRONMENTAL TESTING, INC.
Cambridge Division, 12 Oak Park, Bedford, MA 01730

SAMPLED BY
CHARLES E. HAEFNER (Print Name) Charles E Haefner Jr (Signature)
A. Douglas WEEKS JR (Print Name) A Douglas Weeks Jr (Signature)

SAMPLE NO.	DATE	TIME	SAMPLE LOCATION	CONTAINER SIZE	CONTAINER G/P	GRAB	COMP	NO. OF CONTAINERS	SAMPLE MATRIX	PRESERVATIVE	Volatile Organics	Extractable Organics	Pesticides/PCBs	Metals	Cyanide	Phenols	5 Day TA	Normal TA	COMMENTS
V-92-340-W45	9/23	1338	WEST STORAGE PAD	4oz	G	X		1	SOIL	ICE	X						X		EPA SW846
V-92-341-W45		1340				X		1		ICE	X							X	Method 8240
V-92-342-W51		1050				X		1		ICE	X						X		
CV-92-343-W51		1050				X		1		ICE	X							X	
CV-92-344-W56		1219				X		1		ICE	X						X		
CV-92-345-W56		1219				X		1		ICE	X							X	
V-92-346-W60		1250				X		1		ICE	X						X		
V-92-347-W60A		1310				X		1		ICE	X						X		
V-92-348-W6		1120				X		1		ICE	X							X	
V-92-349-W44		1135				X		1		ICE	X							X	
V-92-359-W60A		1310				X		1		ICE	X							X	
V-92-357-FBW		1353	"	"	"	X		2	WATER	ICE	X						X		

CCH

Relinquished by	Date / Time	Received by	Relinquished by	Date / Time	Received by
Charles E Haefner Jr	9/23 1725			9/24 11:00	Maureen D'Ilorio
Relinquished by	Date / Time	Received by	Relinquished by	Date / Time	Received for Laboratory by

Method of Shipment: Fed Express

Normal TA = Hold pending results of 5 day TA sample analysis for check Haefner 9/24/92 - EZ

PT 1 — ORIGINAL PT 2 NET Project Manager—Yellow PT 3—Customer Copy—Pink

Temp 5°

CHAIN OF CUSTODY RECORD

PROJECT NAME PPG CIRCLEVILLE
COMPANY ICF KAISER ENGINEERS
ADDRESS 4 Gateway Center Pittsburgh PA 15222
PHONE (412) 497-2385

NET NATIONAL ENVIRONMENTAL TESTING, INC.
Cambridge Division, 12 Oak Park, Bedford, MA 01730

92.34098
92.34096

SAMPLED BY CHARLES E. HAEFNER (Print Name) Signature Charles E Haef Jr
A. DOUGLAS WEEKS JR (Print Name) Signature A. Douglas Weeks JR.

SAMPLE NO.	DATE	TIME	SAMPLE LOCATION	CONTAINER SIZE	CONTAINER G/P	GRAB	COMP	NO. OF CONTAINERS	SAMPLE MATRIX	PRESERVATIVE	Volatile Organics	Extractable Organics	Pesticides/PCBs	Metals	Cyanide	Phenols	5 Day TA	NORMAL TA	COMMENTS
V-92-350-S79	9/23	1645	SOUTH STORAGE PAD	4oz	G	X		1	SOIL	ICE	X						X		EPA SW846
V-92-351-S79	↓	1645	↓	↓	G	X		1	SOIL	ICE	X							X	Method 8240
~~V-92-352-S146~~		~~[illegible]~~			~~G~~	~~X~~		~~1~~	~~SOIL~~	~~ICE~~	~~X~~								
~~V-92-353-S146~~					~~G~~	~~X~~			~~SOIL~~	~~ICE~~	~~X~~								
V-92-354-S152		1710			G	X		1	SOIL	ICE	X						X		
V-92-355-S152		1710			G	X		1	SOIL	ICE	X							X	
V-92-356-S100	↓	1725	↓	↓	G	X		1	SOIL	ICE	X							X	↓

CHARLES E. HAEFNER
WEEKS
ICE X

Relinquished by:	Date / Time	Received by:	Relinquished by:	Date / Time	Received by:
CHARLES E. HAEFNER	9/23			9/24 11:00	[signature]
Relinquished by: Charles E Haef Jr	Date / Time	Received by:	Relinquished by:	Date / Time	Received for Laboratory by:

Method of Shipment: FED Express

Remarks: Normal TA = Hold Pending Results of RUSH Samples per Chuck Haefner - 9/24/92 - E

PT 1 — ORIGINAL PT 2 NET Project Manager—Yellow PT 3—Customer Copy—Pink

9234.
92.34113

CHAIN OF CUSTODY RECORD

PROJECT NAME PPG CIRCLEVILLE
COMPANY ICF KAISER ENGINEERS
ADDRESS FOUR GATEWAY CENTER Pittsburgh PA 15222
PHONE (412) 497

NET NATIONAL ENVIRONMENTAL TESTING, INC.
Cambridge Division, 12 Oak Park, Bedford, MA 01730

SAMPLED BY
A. Douglas Weeks Jr (Print Name) Signature A. Douglas Weeks Jr
CHARLES E. HAEFNER (Print Name) Signature Charles E. Haefner

SAMPLE NO.	DATE	TIME	SAMPLE LOCATION	CONTAINER SIZE	CONTAINER G/P	GRAB	COMP	NO. OF CONTAINERS	SAMPLE MATRIX	PRESERVATIVE	Volatile Organics	Extractable Organics	Pesticides/PCBs	Metals	Cyanide	Phenols	5 DAY TA		Hold these samples		COMMENTS
V-92-330-I34	9/24	0906	Incinerator PAD	4oz	G	X		1	Soil	ICE	X						X				EPA SW846
1-92-331-I34	9/24	0910	Incinerator Pad								X								X		Method 8240
1-92-332-I36	9/24	0932									X						X				
1-92-333-I36	9/24	0940									X								X		
1-92-334-I56	9/24	0830									X						X				
1-92-335-I56	9/24	0830									X								X		
1-92-336-I113	9/24	0830									X						X				
1-92-337-I113	9/24	0830									X								X		
1-92-338-I24	9/24	0955									X								X		
V-92-339-I45	9/24	0815									X								X		
-92-358-FBI	9/24	1015		40ml	G	X		2	Water	ICE	X						X				
1-92-355-S146	9/24	1115	South Storage PAD	4oz	G	X		1	Soil	ICE	X								X		
-92-360-S146	9/24	1120	South Storage PAD	"	"	X		1	Soil	ICE	X						X				

Relinquished by:	Date / Time	Received by:	Relinquished by:	Date / Time	Received by:
CHARLES E. HAEFNER Charles E. Haefner	9/24/92 1230			9/25 11:00	Maureen O. Sheeran
Relinquished by:	Date / Time	Received by:	Relinquished by:	Date / Time	Received for Laboratory by:

Method of Shipment: NET 798251
FEDEX

PT 1 — ORIGINAL PT 2 NET Project Manager—Yellow PT 3—Customer Copy—Pink

ANALYTICAL REPORT

Report To: Mr. Robert Bear
ICF Kaiser Engineers
Four Gateway Center
12th Floor
Pittsburgh, PA 15222

Project: PPG Soil VOAs-Now RUN

10/19/1992

NET Job Number: 92.34098

National Environmental Testing

NET Atlantic, Inc.
Cambridge Division
12 Oak Park
Bedford, MA 01730

NET Cambridge Division

ANALYTICAL REPORT

Report To:	Reported By:
Mr. Robert Bear ICF Kaiser Engineers Four Gateway Center 12th Floor Pittsburgh, PA 15222	National Environmental Testing NET Atlantic, Incorporated Cambridge Division 12 Oak Park Bedford, MA 01730

Report Date: 10/19/1992 Collected By: ICF NET Job Number: 92.34098

Project: PPG Soil VOAs-Now RUN Shipped Via: FEDEX Client P.O. No: bill to ICF dir

Job Description: PPG Soil VOAs-NOW RUN Airbill No: 4450798273 NET Client No: 49655

This report has been approved and certified for release by the following staff. Please feel free to call the NET Project Manager at 617-275-3535 with any questions or comments.

Edward A. Lawler
NET Project Manager

Michael F. Delaney, Ph.D.
Laboratory Director

Analytical data for the following samples are included in this data report.

SAMPLE ID	NET ID	DATE TAKEN	TIME TAKEN	DATE REC'D	MATRIX
CV-92-351-S79	67060	09/23/1992	16:45	09/24/1992	SOIL
CV-92-359-W60A	67068	09/23/1992	13:10	09/24/1992	SOIL

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 10/19/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34098

Project: PPG Soil VOAs-Now RUN

Date Rec'd: 09/24/1992

Sample ID: CV-92-351-S79

NET Sample No: 67060

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<6.0	ug/Kg	10/06/1992	dry
Benzene	<6.0	ug/Kg		
Bromodichloromethane	<6.0	ug/Kg		
Bromoform	<6.0	ug/Kg		
Bromomethane	<6.0	ug/Kg		
2-Butanone (MEK)	<6.0	ug/Kg		
Carbon Disulfide	<6.0	ug/Kg		
Carbon Tetrachloride	<6.0	ug/Kg		
Chlorobenzene	<6.0	ug/Kg		
Chloroethane	<6.0	ug/Kg		
2-Chloroethylvinyl ether	<6.0	ug/Kg		
Chloroform	<6.0	ug/Kg		
Chloromethane	<6.0	ug/Kg		
Dibromochloromethane	<6.0	ug/Kg		
1,2-Dichlorobenzene	<6.0	ug/Kg		
1,3-Dichlorobenzene	<6.0	ug/Kg		
1,4-Dichlorobenzene	<6.0	ug/Kg		
1,1-Dichloroethane	<6.0	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg		
1,1-Dichloroethene	<6.0	ug/Kg		
trans-1,2-Dichloroethene	<6.0	ug/Kg		
1,2-Dichloropropane	<6.0	ug/Kg		
cis-1,3-Dichloropropene	<6.0	ug/Kg		
trans-1,3-Dichloropropene	<6.0	ug/Kg		
Ethylbenzene	<6.0	ug/Kg		
2-Hexanone	<6.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
Methylene Chloride	<6.0	ug/Kg		
Styrene	<6.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg		
Tetrachloroethene	<6.0	ug/Kg		
Toluene	<6.0	ug/Kg		
1,1,1-Trichloroethane	<6.0	ug/Kg		
1,1,2-Trichloroethane	<6.0	ug/Kg		
Trichloroethene	<6.0	ug/Kg		
Trichlorofluoromethane	<6.0	ug/Kg		
Vinyl Acetate	<6.0	ug/Kg		
Vinyl Chloride	<6.0	ug/Kg		
m-Xylene	<6.0	ug/Kg		
o-Xylene	<6.0	ug/Kg		
p-Xylene	<6.0	ug/Kg		

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 10/19/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34098

Project: PPG Soil VOAs-Now RUN

Date Rec'd: 09/24/1992

Sample ID: CV-92-359-W60A

NET Sample No: 67068

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<5.0	ug/Kg	10/06/1992	dhg
Benzene	<5.0	ug/Kg		
Bromodichloromethane	<5.0	ug/Kg		
Bromoform	<5.0	ug/Kg		
Bromomethane	<5.0	ug/Kg		
2-Butanone (MEK)	<5.0	ug/Kg		
Carbon Disulfide	<5.0	ug/Kg		
Carbon Tetrachloride	<5.0	ug/Kg		
Chlorobenzene	<5.0	ug/Kg		
Chloroethane	<5.0	ug/Kg		
2-Chloroethylvinyl ether	<5.0	ug/Kg		
Chloroform	<5.0	ug/Kg		
Chloromethane	<5.0	ug/Kg		
Dibromochloromethane	<5.0	ug/Kg		
1,2-Dichlorobenzene	<5.0	ug/Kg		
1,3-Dichlorobenzene	<5.0	ug/Kg		
1,4-Dichlorobenzene	<5.0	ug/Kg		
1,1-Dichloroethane	<5.0	ug/Kg		
1,2-Dichloroethane	<5.0	ug/Kg		
1,1-Dichloroethene	<5.0	ug/Kg		
trans-1,2-Dichloroethene	<5.0	ug/Kg		
1,2-Dichloropropane	<5.0	ug/Kg		
cis-1,3-Dichloropropene	<5.0	ug/Kg		
trans-1,3-Dichloropropene	<5.0	ug/Kg		
Ethylbenzene	<5.0	ug/Kg		
2-Hexanone	<5.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<5.0	ug/Kg		
Methylene Chloride	<5.0	ug/Kg		
Styrene	<5.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg		
Tetrachloroethene	<5.0	ug/Kg		
Toluene	<5.0	ug/Kg		
1,1,1-Trichloroethane	<5.0	ug/Kg		
1,1,2-Trichloroethane	<5.0	ug/Kg		
Trichloroethene	<5.0	ug/Kg		
Trichlorofluoromethane	<5.0	ug/Kg		
Vinyl Acetate	<5.0	ug/Kg		
Vinyl Chloride	<5.0	ug/Kg		
m-Xylene	<5.0	ug/Kg		
o-Xylene	<5.0	ug/Kg		
p-Xylene	<5.0	ug/Kg		

temp 5

92.34098
92.34096

CHAIN OF CUSTODY RECORD

PROJECT NAME PPG CIRCLEVILLE
COMPANY ICF KAISER ENGINEERS
ADDRESS 4 Gateway Center Pittsburgh PA 15222
PHONE (412) 497-2385

NET NATIONAL ENVIRONMENTAL TESTING, INC.
Cambridge Division, 12 Oak Park, Bedford, MA 01730

SAMPLED BY
CHARLES E. HAEFNER (Print Name) Signature Charles E Haefner
A. DOUGLAS WEEKS JR (Print Name) Signature A. Douglas Weeks JR.

SAMPLE NO.	DATE	TIME	SAMPLE LOCATION	CONTAINER SIZE	CONTAINER G/P	GRAB	COMP	NO OF CONTAINERS	SAMPLE MATRIX	PRESERVATIVE	Volatile Organics	Extractable Organics	Pesticides/PCBs	Metals	Cyanide	Phenols	[illegible] TA		NRMALTA		COMMENTS
-92-350-S17	9/23	1645	SOUTH STORAGE YARD	4 oz	G	✓		1	SOIL	ICE	✓						X				EPA SW846
-92-351-S17		1645			G	X		1	SOIL	ICE	✓								X		Method 8240
~~-92-352-S146~~		~~1610~~			~~G~~	~~X~~		~~1~~	~~SOIL~~	~~ICE~~	~~X~~										
~~-92-353-S146~~					~~G~~	~~X~~		~~1~~	~~SOIL~~	~~ICE~~	~~X~~										
-92-354-S152		1710			G	X		1	SOIL	ICE	X						X				
1-92-355-S152		1710			G	X		1	SOIL	ICE	X								X		
1-92-356-S100		1725			G	X		1	SOIL	ICE	X								X		

Relinquished by:	Date / Time	Received by:	Relinquished by:	Date / Time	Received by:
CHARLES E. HAEFNER	9/23			9/24 11:00	Maureen D Sheeran
Relinquished by: Charles E Haefner	Date / Time	Received by:	Relinquished by:	Date / Time	Received for Laboratory by:

Method of Shipment
FEDERAL Express

Remarks: (*) Normal TA = Hold Pending results of RUSH Samples
per Chuck Haefner - 9/24/92

MPS H 925 7268 404

PT 1 — ORIGINAL   PT 2 NET Project Manager—Yellow   PT 3—Customer Copy—Pink

92. 34098

CHAIN OF CUSTODY RECORD

PROJECT NAME PPG CIRCLEVILLE
COMPANY ICF KAISER ENGINEERS
ADDRESS 4 Gateway Center Pittsburgh PA 15222
PHONE (412) 497-2385

NET NATIONAL ENVIRONMENTAL TESTING, INC.

Cambridge Division, 12 Oak Park, Bedford, MA 01730

SAMPLED BY

CHARLES E. HAEFNER — Charles E Haefner Jr
(Print Name) — Signature

A. Douglas WEEKS JR — A. Douglas Weeks Jr
(Print Name) — Signature

SAMPLE NO.	DATE	TIME	SAMPLE LOCATION	CONTAINER SIZE	CONTAINER G/P	GRAB	COMP	NO OF CONTAINERS	SAMPLE MATRIX	PRESERVATIVE	Volatile Organics	Extractable Organics	Pesticides/PCBs	Metals	Cyanide	Phenols	5 DAY TA	NORMAL TA	COMMENTS
92-34[illegible] W45	9/23	1334	WEST [illegible] TAP	40cc	G	X		1	[illegible]	ICE	X						X		EPA SW846 Method 8240
-92-341-W45		1340				X		1		ICE	X							X	
-92-342-W51		1050				X		1		ICE	X						X		
-92-343-W51		1050				X		1		ICE	X							X	
-92-344-W56		1219				X		1		ICE	X						X		
-92-345-W56		1219				X		1		ICE	X							X	
-92-346-W60		1250				X		1		ICE	X						X		
-92-347-W60A		1310				X		1		ICE	X						X		
-92-348-W6		1120				X		1		ICE	X							X	
-92-349-W44		1135				X		1		ICE	X							X	
-92-359-W60A		1310				X		1		ICE	X							X	
-92-351-FB3W		1353	"	"	"	X		2	WATER	ICE	X						X		

~~[illegible]~~ CCN

Relinquished by	Date / Time	Received by:	Relinquished by:	Date / Time	Received by:
Charles E Haefner Jr	9/23 1725			9/24 11:00	Maureen A. Pisano
Relinquished by	Date / Time	Received by:	Relinquished by:	Date / Time	Received for Laboratory by:

Method of Shipment: Fed - X - press

Remarks: ® Normal TA = Hold Pending results of 5 day TA Sample Analysis per Chuck Haefner 9/24/92 CC

PT 1 — ORIGINAL PT 2 NET Project Manager—Yellow PT 3—Customer Copy—Pink

0050798273

ANALYTICAL REPORT

Report To: Mr. Robert Bear
ICF Kaiser Engineers
Four Gateway Center
12th Floor
Pittsburgh, PA 15222

Project: PPG RUSH SOIL VOAs

11/10/1992

NET Job Number: 92.34511

National Environmental Testing

NET Atlantic, Inc.
Cambridge Division
12 Oak Park
Bedford, MA 01730

NET Cambridge Division

ANALYTICAL REPORT

Report To:	Reported By:
Mr. Robert Bear ICF Kaiser Engineers Four Gateway Center 12th Floor Pittsburgh, PA 15222	National Environmental Testing NET Atlantic, Incorporated Cambridge Division 12 Oak Park Bedford, MA 01730

Report Date: 11/10/1992

Collected By: ICF

NET Job Number: 92.34511

Project: PPG RUSH SOIL VOAs

Shipped Via: FEDEX

Client P.O. No: bill to ICF dir

Job Description: PPG RUSH SOIL VOAs

Airbill No: 3977256920

NET Client No: 49655

This report has been approved and certified for release by the following staff. Please feel free to call the NET Project Manager at 617-275-3535 with any questions or comments.

Edward A. Lawler
NET Project Manager

Michael F. Delaney, Ph.D.
Laboratory Director

Analytical data for the following samples are included in this data report.

SAMPLE ID	NET ID	DATE TAKEN	TIME TAKEN	DATE REC'D	MATRIX
CV-92-0524-I24	68790	10/31/1992	10:25	11/02/1992	SOIL
CV-92-0525-I45	68791	10/31/1992	10:40	11/02/1992	SOIL
CV-92-0526-S100	68792	10/31/1992	11:08	11/02/1992	SOIL
CV-92-0527-W6	68793	10/31/1992	11:45	11/02/1992	SOIL
CV-92-0528-W44	68794	10/31/1992	11:30	11/02/1992	SOIL
CV-92-0529-FBW	68795	10/31/1992	11:55	11/02/1992	BLANK

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 11/10/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Date Rec'd: 11/02/1992

Sample ID: CV-92-0524-124

NET Sample No: 68790

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<6.0	ug/Kg	11/05/1992	dhg
Benzene	<6.0	ug/Kg		
Bromodichloromethane	<6.0	ug/Kg		
Bromoform	<6.0	ug/Kg		
Bromomethane	<6.0	ug/Kg		
2-Butanone (MEK)	<6.0	ug/Kg		
Carbon Disulfide	<6.0	ug/Kg		
Carbon Tetrachloride	<6.0	ug/Kg		
Chlorobenzene	<6.0	ug/Kg		
Chloroethane	<6.0	ug/Kg		
2-Chloroethylvinyl ether	<6.0	ug/Kg		
Chloroform	<6.0	ug/Kg		
Chloromethane	<6.0	ug/Kg		
Dibromochloromethane	<6.0	ug/Kg		
1,2-Dichlorobenzene	<6.0	ug/Kg		
1,3-Dichlorobenzene	<6.0	ug/Kg		
1,4-Dichlorobenzene	<6.0	ug/Kg		
1,1-Dichloroethane	<6.0	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg		
1,1-Dichloroethene	<6.0	ug/Kg		
trans-1,2-Dichloroethene	<6.0	ug/Kg		
1,2-Dichloropropane	<6.0	ug/Kg		
cis-1,3-Dichloropropene	<6.0	ug/Kg		
trans-1,3-Dichloropropene	<6.0	ug/Kg		
Ethylbenzene	<6.0	ug/Kg		
2-Hexanone	<6.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
Methylene Chloride	21	ug/Kg		
Styrene	<6.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg		
Tetrachloroethene	<6.0	ug/Kg		
Toluene	<6.0	ug/Kg		
1,1,1-Trichloroethane	<6.0	ug/Kg		
1,1,2-Trichloroethane	<6.0	ug/Kg		
Trichloroethene	<6.0	ug/Kg		
Trichlorofluoromethane	<6.0	ug/Kg		
Vinyl Acetate	<6.0	ug/Kg		
Vinyl Chloride	<6.0	ug/Kg		
m-Xylene	<6.0	ug/Kg		
o-Xylene	<6.0	ug/Kg		
p-Xylene	<6.0	ug/Kg		

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 11/10/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Date Rec'd: 11/02/1992

Sample ID: CV-92-0525-145

NET Sample No: 68791

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<5.0	ug/Kg	11/05/1992	dhg
Benzene	<5.0	ug/Kg		
Bromodichloromethane	<5.0	ug/Kg		
Bromoform	<5.0	ug/Kg		
Bromomethane	<5.0	ug/Kg		
2-Butanone (MEK)	<5.0	ug/Kg		
Carbon Disulfide	<5.0	ug/Kg		
Carbon Tetrachloride	<5.0	ug/Kg		
Chlorobenzene	<5.0	ug/Kg		
Chloroethane	<5.0	ug/Kg		
2-Chloroethylvinyl ether	<5.0	ug/Kg		
Chloroform	<5.0	ug/Kg		
Chloromethane	<5.0	ug/Kg		
Dibromochloromethane	<5.0	ug/Kg		
1,2-Dichlorobenzene	<5.0	ug/Kg		
1,3-Dichlorobenzene	<5.0	ug/Kg		
1,4-Dichlorobenzene	<5.0	ug/Kg		
1,1-Dichloroethane	<5.0	ug/Kg		
1,2-Dichloroethane	<5.0	ug/Kg		
1,1-Dichloroethene	<5.0	ug/Kg		
trans-1,2-Dichloroethene	<5.0	ug/Kg		
1,2-Dichloropropane	<5.0	ug/Kg		
cis-1,3-Dichloropropene	<5.0	ug/Kg		
trans-1,3-Dichloropropene	<5.0	ug/Kg		
Ethylbenzene	<5.0	ug/Kg		
2-Hexanone	<5.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<5.0	ug/Kg		
Methylene Chloride	13	ug/Kg		
Styrene	<5.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg		
Tetrachloroethene	<5.0	ug/Kg		
Toluene	<5.0	ug/Kg		
1,1,1-Trichloroethane	<5.0	ug/Kg		
1,1,2-Trichloroethane	<5.0	ug/Kg		
Trichloroethene	<5.0	ug/Kg		
Trichlorofluoromethane	<5.0	ug/Kg		
Vinyl Acetate	<5.0	ug/Kg		
Vinyl Chloride	<5.0	ug/Kg		
m-Xylene	<5.0	ug/Kg		
o-Xylene	<5.0	ug/Kg		
p-Xylene	<5.0	ug/Kg		

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 11/10/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Date Rec'd: 11/02/1992

Sample ID: CV-92-0526-S100

NET Sample No: 68792

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<6.0	ug/Kg	11/05/1992	dhg
Benzene	<6.0	ug/Kg		
Bromodichloromethane	<6.0	ug/Kg		
Bromoform	<6.0	ug/Kg		
Bromomethane	<6.0	ug/Kg		
2-Butanone (MEK)	<6.0	ug/Kg		
Carbon Disulfide	<6.0	ug/Kg		
Carbon Tetrachloride	<6.0	ug/Kg		
Chlorobenzene	<6.0	ug/Kg		
Chloroethane	<6.0	ug/Kg		
2-Chloroethylvinyl ether	<6.0	ug/Kg		
Chloroform	<6.0	ug/Kg		
Chloromethane	<6.0	ug/Kg		
Dibromochloromethane	<6.0	ug/Kg		
1,2-Dichlorobenzene	<6.0	ug/Kg		
1,3-Dichlorobenzene	<6.0	ug/Kg		
1,4-Dichlorobenzene	<6.0	ug/Kg		
1,1-Dichloroethane	<6.0	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg		
1,1-Dichloroethene	<6.0	ug/Kg		
trans-1,2-Dichloroethene	<6.0	ug/Kg		
1,2-Dichloropropane	<6.0	ug/Kg		
cis-1,3-Dichloropropene	<6.0	ug/Kg		
trans-1,3-Dichloropropene	<6.0	ug/Kg		
Ethylbenzene	<6.0	ug/Kg		
2-Hexanone	<6.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
Methylene Chloride	31	ug/Kg		
Styrene	<6.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg		
Tetrachloroethene	<6.0	ug/Kg		
Toluene	<6.0	ug/Kg		
1,1,1-Trichloroethane	<6.0	ug/Kg		
1,1,2-Trichloroethane	<6.0	ug/Kg		
Trichloroethene	<6.0	ug/Kg		
Trichlorofluoromethane	<6.0	ug/Kg		
Vinyl Acetate	<6.0	ug/Kg		
Vinyl Chloride	<6.0	ug/Kg		
m-Xylene	<6.0	ug/Kg		
o-Xylene	<6.0	ug/Kg		
p-Xylene	<6.0	ug/Kg		

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 11/10/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Date Rec'd: 11/02/1992

Sample ID: CV-92-0527-W6

NET Sample No: 68793

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<6.0	ug/Kg	11/08/1992	dhg
Benzene	<6.0	ug/Kg		
Bromodichloromethane	<6.0	ug/Kg		
Bromoform	<6.0	ug/Kg		
Bromomethane	<6.0	ug/Kg		
2-Butanone (MEK)	<6.0	ug/Kg		
Carbon Disulfide	<6.0	ug/Kg		
Carbon Tetrachloride	<6.0	ug/Kg		
Chlorobenzene	<6.0	ug/Kg		
Chloroethane	<6.0	ug/Kg		
2-Chloroethylvinyl ether	<6.0	ug/Kg		
Chloroform	<6.0	ug/Kg		
Chloromethane	<6.0	ug/Kg		
Dibromochloromethane	<6.0	ug/Kg		
1,2-Dichlorobenzene	<6.0	ug/Kg		
1,3-Dichlorobenzene	<6.0	ug/Kg		
1,4-Dichlorobenzene	<6.0	ug/Kg		
1,1-Dichloroethane	<6.0	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg		
1,1-Dichloroethene	<6.0	ug/Kg		
trans-1,2-Dichloroethene	<6.0	ug/Kg		
1,2-Dichloropropane	<6.0	ug/Kg		
cis-1,3-Dichloropropene	<6.0	ug/Kg		
trans-1,3-Dichloropropene	<6.0	ug/Kg		
Ethylbenzene	<6.0	ug/Kg		
2-Hexanone	<6.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
Methylene Chloride	<6.0	ug/Kg		
Styrene	<6.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg		
Tetrachloroethene	<6.0	ug/Kg		
Toluene	<6.0	ug/Kg		
1,1,1-Trichloroethane	<6.0	ug/Kg		
1,1,2-Trichloroethane	<6.0	ug/Kg		
Trichloroethene	<6.0	ug/Kg		
Trichlorofluoromethane	<6.0	ug/Kg		
Vinyl Acetate	<6.0	ug/Kg		
Vinyl Chloride	<6.0	ug/Kg		
m-Xylene	<6.0	ug/Kg		
o-Xylene	<6.0	ug/Kg		
p-Xylene	<6.0	ug/Kg		

NET Cambridge Division.
ANALYTICAL REPORT

Report Date: 11/10/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Date Rec'd: 11/02/1992

Sample ID: CV-92-0528-W44

NET Sample No: 68794

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 8240 S				
Acetone	<6.0	ug/Kg	11/05/1992	dhg
Benzene	<6.0	ug/Kg		
Bromodichloromethane	<6.0	ug/Kg		
Bromoform	<6.0	ug/Kg		
Bromomethane	<6.0	ug/Kg		
2-Butanone (MEK)	<6.0	ug/Kg		
Carbon Disulfide	<6.0	ug/Kg		
Carbon Tetrachloride	<6.0	ug/Kg		
Chlorobenzene	<6.0	ug/Kg		
Chloroethane	<6.0	ug/Kg		
2-Chloroethylvinyl ether	<6.0	ug/Kg		
Chloroform	<6.0	ug/Kg		
Chloromethane	<6.0	ug/Kg		
Dibromochloromethane	<6.0	ug/Kg		
1,2-Dichlorobenzene	<6.0	ug/Kg		
1,3-Dichlorobenzene	<6.0	ug/Kg		
1,4-Dichlorobenzene	<6.0	ug/Kg		
1,1-Dichloroethane	<6.0	ug/Kg		
1,2-Dichloroethane	<6.0	ug/Kg		
1,1-Dichloroethene	<6.0	ug/Kg		
trans-1,2-Dichloroethene	<6.0	ug/Kg		
1,2-Dichloropropane	<6.0	ug/Kg		
cis-1,3-Dichloropropene	<6.0	ug/Kg		
trans-1,3-Dichloropropene	<6.0	ug/Kg		
Ethylbenzene	<6.0	ug/Kg		
2-Hexanone	<6.0	ug/Kg		
4-Methyl-2-pentanone (MIBK	<6.0	ug/Kg		
Methylene Chloride	<6.0	ug/Kg		
Styrene	<6.0	ug/Kg		
1,1,2,2-Tetrachloroethane	<6.0	ug/Kg		
Tetrachloroethene	<6.0	ug/Kg		
Toluene	<6.0	ug/Kg		
1,1,1-Trichloroethane	<6.0	ug/Kg		
1,1,2-Trichloroethane	<6.0	ug/Kg		
Trichloroethene	<6.0	ug/Kg		
Trichlorofluoromethane	<6.0	ug/Kg		
Vinyl Acetate	<6.0	ug/Kg		
Vinyl Chloride	<6.0	ug/Kg		
m-Xylene	<6.0	ug/Kg		
o-Xylene	<6.0	ug/Kg		
p-Xylene	<6.0	ug/Kg		

NET Cambridge Division
ANALYTICAL REPORT

Report Date: 11/10/1992

Report To: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Date Rec'd: 11/02/1992

Sample ID: CV-92-0529-FBW

NET Sample No: 68795

Parameter	Result	Units	Analysis Date	Analyst
TCL Volatiles by GC/MS 624 AQ				
Acetone	<5.0	ug/L	11/04/1992	cdl
Benzene	<5.0	ug/L		
Bromodichloromethane	<5.0	ug/L		
Bromoform	<5.0	ug/L		
Bromomethane	<5.0	ug/L		
2-Butanone (MEK)	<5.0	ug/L		
Carbon Disulfide	<5.0	ug/L		
Carbon Tetrachloride	<5.0	ug/L		
Chlorobenzene	<5.0	ug/L		
Chloroethane	<5.0	ug/L		
2-Chloroethylvinyl ether	<5.0	ug/L		
Chloroform	<5.0	ug/L		
Chloromethane	<5.0	ug/L		
Dibromochloromethane	<5.0	ug/L		
1,2-Dichlorobenzene	<5.0	ug/L		
1,3-Dichlorobenzene	<5.0	ug/L		
1,4-Dichlorobenzene	<5.0	ug/L		
1,1-Dichloroethane	<5.0	ug/L		
1,2-Dichloroethane	<5.0	ug/L		
1,1-Dichloroethene	<5.0	ug/L		
trans-1,2-Dichloroethene	<5.0	ug/L		
1,2-Dichloropropane	<5.0	ug/L		
cis-1,3-Dichloropropene	<5.0	ug/L		
trans-1,3-Dichloropropene	<5.0	ug/L		
Ethylbenzene	<5.0	ug/L		
2-Hexanone	<5.0	ug/L		
4-Methyl-2-pentanone (MIBK	<5.0	ug/L		
Methylene Chloride	<5.0	ug/L		
Styrene	<5.0	ug/L		
1,1,2,2-Tetrachloroethane	<5.0	ug/L		
Tetrachloroethene	<5.0	ug/L		
Toluene	<5.0	ug/L		
1,1,1-Trichloroethane	<5.0	ug/L		
1,1,2-Trichloroethane	<5.0	ug/L		
Trichloroethene	<5.0	ug/L		
Trichlorofluoromethane	<5.0	ug/L		
Vinyl Acetate	<5.0	ug/L		
Vinyl Chloride	<5.0	ug/L		
m-Xylene	<5.0	ug/L		
o-Xylene	<5.0	ug/L		
p-Xylene	<5.0	ug/L		

NET Cambridge Division

QUALITY CONTROL DATA

Client: ICF Kaiser Engineers — NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs — Report Date: 11/10/1992

Surrogate Standard Percent Recovery

Abbreviated Surrogate Standard Names:

SS1	SS2	SS3	SS4	SS5	SS6	SS7	SS8	SS9	SS10	SS11	SS12
Bromofl	1,2-Dic	Toluene	Bromofl	1,2-Dic	Toluene						

						Percent Recovery									
Sample ID	NET ID	Matrix	SS1	SS2	SS3	SS4	SS5	SS6	SS7	SS8	SS9	SS10	SS11	SS12
CV-92-0524-I24	68790	SOIL				76	81	95						
CV-92-0525-I45	68791	SOIL				85	88	119						
CV-92-0526-S100	68792	SOIL				86	98	111						
CV-92-0527-W6	68793	SOIL				88	78	93						
CV-92-0528-W44	68794	SOIL				82	96	115						
CV-92-0529-FBW	68795	BLANK	107	100	95									

Notes:

NR - This surrogate standard is Not Required. Other versions of this test method may use this surrogate standard.

Dil - This surrogate standard was diluted to below detectable levels due to concentrations of analytes in this sample.

Complete Surrogate Standard Names Listed by Analysis:

<u>Pesticide Surrogate Standards</u>:

Decachl = Decachlorobiphenyl — Dibutyl = Dibutylchlorendate — Tetrach = Tetrachloro-m-xylene

<u>Volatile Surrogate Standards</u>:

Bromofl = Bromofluorobenzene — 1,2-Dichl = 1,2-Dichloroethane-d4 — Toluene = Toluene-d8

Drinking Water Method 524 1,2-Dichl = 1,2-Dichlorobenzene-d4

<u>Semivolatlile Surrogate Standards</u>:

2-Fluor (1st) = 2-Fluorobiphenyl — Phenol- = Phenol-d6 — 2,4,6-T = 2,4,6-Tribromophenol

2-Fluor (2nd) = 2-Fluorophenol — Nitrobe = Nitrobenzene-d5 — p-Terph = p-Terphenyl

<u>Herbicides Surrogate Standard</u>:

2,4-Dic = 2,4-Dichlorophenyl acetic acid

<u>Petroleum Hydrocarbon Fingerprint Surrogate Standard</u>:

2-Fluor = 2-Fluorobiphenyl — para-Te = para-Terphynyl

NET Cambridge Division
QUALITY CONTROL DATA

Report To: ICF Kaiser Engineers NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs Report Date : 11/10/1992

Method Blank Analysis Data

Test Name	Result	Units	Run Batch	Run Date	Analyst Initials
TCL Volatiles by GC/MS 8240 S					
Bromofluorobenzene	108	% recov.	281	11/05/1992	dhg
1,2-Dichloroethane-d4	102	% recov.	281	11/05/1992	dhg
Toluene-d8	107	% recov.	281	11/05/1992	dhg
Acetone	<5.0	ug/Kg	281	11/05/1992	dhg
Benzene	<5.0	ug/Kg	281	11/05/1992	dhg
Bromodichloromethane	<5.0	ug/Kg	281	11/05/1992	dhg
Bromoform	<5.0	ug/Kg	281	11/05/1992	dhg
Bromomethane	<5.0	ug/Kg	281	11/05/1992	dhg
2-Butanone (MEK)	<5.0	ug/Kg	281	11/05/1992	dhg
Carbon Disulfide	<5.0	ug/Kg	281	11/05/1992	dhg
Carbon Tetrachloride	<5.0	ug/Kg	281	11/05/1992	dhg
Chlorobenzene	<5.0	ug/Kg	281	11/05/1992	dhg
Chloroethane	<5.0	ug/Kg	281	11/05/1992	dhg
2-Chloroethylvinyl ether	<5.0	ug/Kg	281	11/05/1992	dhg
Chloroform	<5.0	ug/Kg	281	11/05/1992	dhg
Chloromethane	<5.0	ug/Kg	281	11/05/1992	dhg
Dibromochloromethane	<5.0	ug/Kg	281	11/05/1992	dhg
1,2-Dichlorobenzene	<5.0	ug/Kg	281	11/05/1992	dhg
1,3-Dichlorobenzene	<5.0	ug/Kg	281	11/05/1992	dhg
1,4-Dichlorobenzene	<5.0	ug/Kg	281	11/05/1992	dhg
1,1-Dichloroethane	<5.0	ug/Kg	281	11/05/1992	dhg
1,2-Dichloroethane	<5.0	ug/Kg	281	11/05/1992	dhg
1,1-Dichloroethene	<5.0	ug/Kg	281	11/05/1992	dhg
trans-1,2-Dichloroethene	<5.0	ug/Kg	281	11/05/1992	dhg
1,2-Dichloropropane	<5.0	ug/Kg	281	11/05/1992	dhg
cis-1,3-Dichloropropene	<5.0	ug/Kg	281	11/05/1992	dhg
trans-1,3-Dichloropropene	<5.0	ug/Kg	281	11/05/1992	dhg
Ethylbenzene	<5.0	ug/Kg	281	11/05/1992	dhg
2-Hexanone	<5.0	ug/Kg	281	11/05/1992	dhg
4-Methyl-2-pentanone (MIBK	<5.0	ug/Kg	281	11/05/1992	dhg
Methylene Chloride	<5.0	ug/Kg	281	11/05/1992	dhg
Styrene	<5.0	ug/Kg	281	11/05/1992	dhg
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg	281	11/05/1992	dhg
Tetrachloroethene	<5.0	ug/Kg	281	11/05/1992	dhg
Toluene	<5.0	ug/Kg	281	11/05/1992	dhg
1,1,1-Trichloroethane	<5.0	ug/Kg	281	11/05/1992	dhg
1,1,2-Trichloroethane	<5.0	ug/Kg	281	11/05/1992	dhg
Trichloroethene	<5.0	ug/Kg	281	11/05/1992	dhg
Trichlorofluoromethane	<5.0	ug/Kg	281	11/05/1992	dhg
Vinyl Acetate	<5.0	ug/Kg	281	11/05/1992	dhg
Vinyl Chloride	<5.0	ug/Kg	281	11/05/1992	dhg
m-Xylene	<5.0	ug/Kg	281	11/05/1992	dhg
o-Xylene	<5.0	ug/Kg	281	11/05/1992	dhg
p-Xylene	<5.0	ug/Kg	281	11/05/1992	dhg

NET Cambridge Division
QUALITY CONTROL DATA

Report To: ICF Kaiser Engineers

NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs

Report Date : 11/10/1992

Method Blank Analysis Data

Test Name	Result	Units	Run Batch	Run Date	Analyst Initials
TCL Volatiles by GC/MS 8240 S					
Bromofluorobenzene	107	% recov.	283	11/08/1992	dhg
1,2-Dichloroethane-d4	91	% recov.	283	11/08/1992	dhg
Toluene-d8	110	% recov.	283	11/08/1992	dhg
Acetone	<5.0	ug/Kg	283	11/08/1992	dhg
Benzene	<5.0	ug/Kg	283	11/08/1992	dhg
Bromodichloromethane	<5.0	ug/Kg	283	11/08/1992	dhg
Bromoform	<5.0	ug/Kg	283	11/08/1992	dhg
Bromomethane	<5.0	ug/Kg	283	11/08/1992	dhg
2-Butanone (MEK)	<5.0	ug/Kg	283	11/08/1992	dhg
Carbon Disulfide	<5.0	ug/Kg	283	11/08/1992	dhg
Carbon Tetrachloride	<5.0	ug/Kg	283	11/08/1992	dhg
Chlorobenzene	<5.0	ug/Kg	283	11/08/1992	dhg
Chloroethane	<5.0	ug/Kg	283	11/08/1992	dhg
2-Chloroethylvinyl ether	<5.0	ug/Kg	283	11/08/1992	dhg
Chloroform	<5.0	ug/Kg	283	11/08/1992	dhg
Chloromethane	<5.0	ug/Kg	283	11/08/1992	dhg
Dibromochloromethane	<5.0	ug/Kg	283	11/08/1992	dhg
1,2-Dichlorobenzene	<5.0	ug/Kg	283	11/08/1992	dhg
1,3-Dichlorobenzene	<5.0	ug/Kg	283	11/08/1992	dhg
1,4-Dichlorobenzene	<5.0	ug/Kg	283	11/08/1992	dhg
1,1-Dichloroethane	<5.0	ug/Kg	283	11/08/1992	dhg
1,2-Dichloroethane	<5.0	ug/Kg	283	11/08/1992	dhg
1,1-Dichloroethene	<5.0	ug/Kg	283	11/08/1992	dhg
trans-1,2-Dichloroethene	<5.0	ug/Kg	283	11/08/1992	dhg
1,2-Dichloropropane	<5.0	ug/Kg	283	11/08/1992	dhg
cis-1,3-Dichloropropene	<5.0	ug/Kg	283	11/08/1992	dhg
trans-1,3-Dichloropropene	<5.0	ug/Kg	283	11/08/1992	dhg
Ethylbenzene	<5.0	ug/Kg	283	11/08/1992	dhg
2-Hexanone	<5.0	ug/Kg	283	11/08/1992	dhg
4-Methyl-2-pentanone (MIBK	<5.0	ug/Kg	283	11/08/1992	dhg
Methylene Chloride	<5.0	ug/Kg	283	11/08/1992	dhg
Styrene	<5.0	ug/Kg	283	11/08/1992	dhg
1,1,2,2-Tetrachloroethane	<5.0	ug/Kg	283	11/08/1992	dhg
Tetrachloroethene	<5.0	ug/Kg	283	11/08/1992	dhg
Toluene	<5.0	ug/Kg	283	11/08/1992	dhg
1,1,1-Trichloroethane	<5.0	ug/Kg	283	11/08/1992	dhg
1,1,2-Trichloroethane	<5.0	ug/Kg	283	11/08/1992	dhg
Trichloroethene	<5.0	ug/Kg	283	11/08/1992	dhg
Trichlorofluoromethane	<5.0	ug/Kg	283	11/08/1992	dhg
Vinyl Acetate	<5.0	ug/Kg	283	11/08/1992	dhg
Vinyl Chloride	<5.0	ug/Kg	283	11/08/1992	dhg
m-Xylene	<5.0	ug/Kg	283	11/08/1992	dhg
o-Xylene	<5.0	ug/Kg	283	11/08/1992	dhg
p-Xylene	<5.0	ug/Kg	283	11/08/1992	dhg

NET Cambridge Division
QUALITY CONTROL DATA

Report To: ICF Kaiser Engineers — NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs — Report Date : 11/10/1992

Method Blank Analysis Data

Test Name	Result	Units	Run Batch	Run Date	Analyst Initials
TCL Volatiles by GC/MS 624 AQ					
Bromofluorobenzene	111	% recov.	846	11/04/1992	cdl
1,2-Dichloroethane-d4	99	% recov.	846	11/04/1992	cdl
Toluene-d8	108	% recov.	846	11/04/1992	cdl
Acetone	<5.0	ug/L	846	11/04/1992	cdl
Benzene	<5.0	ug/L	846	11/04/1992	cdl
Bromodichloromethane	<5.0	ug/L	846	11/04/1992	cdl
Bromoform	<5.0	ug/L	846	11/04/1992	cdl
Bromomethane	<5.0	ug/L	846	11/04/1992	cdl
2-Butanone (MEK)	<5.0	ug/L	846	11/04/1992	cdl
Carbon Disulfide	<5.0	ug/L	846	11/04/1992	cdl
Carbon Tetrachloride	<5.0	ug/L	846	11/04/1992	cdl
Chlorobenzene	<5.0	ug/L	846	11/04/1992	cdl
Chloroethane	<5.0	ug/L	846	11/04/1992	cdl
2-Chloroethylvinyl ether	<5.0	ug/L	846	11/04/1992	cdl
Chloroform	<5.0	ug/L	846	11/04/1992	cdl
Chloromethane	<5.0	ug/L	846	11/04/1992	cdl
Dibromochloromethane	<5.0	ug/L	846	11/04/1992	cdl
1,2-Dichlorobenzene	<5.0	ug/L	846	11/04/1992	cdl
1,3-Dichlorobenzene	<5.0	ug/L	846	11/04/1992	cdl
1,4-Dichlorobenzene	<5.0	ug/L	846	11/04/1992	cdl
1,1-Dichloroethane	<5.0	ug/L	846	11/04/1992	cdl
1,2-Dichloroethane	<5.0	ug/L	846	11/04/1992	cdl
1,1-Dichloroethene	<5.0	ug/L	846	11/04/1992	cdl
trans-1,2-Dichloroethene	<5.0	ug/L	846	11/04/1992	cdl
1,2-Dichloropropane	<5.0	ug/L	846	11/04/1992	cdl
cis-1,3-Dichloropropene	<5.0	ug/L	846	11/04/1992	cdl
trans-1,3-Dichloropropene	<5.0	ug/L	846	11/04/1992	cdl
Ethylbenzene	<5.0	ug/L	846	11/04/1992	cdl
2-Hexanone	<5.0	ug/L	846	11/04/1992	cdl
4-Methyl-2-pentanone (MIBK	<5.0	ug/L	846	11/04/1992	cdl
Methylene Chloride	<5.0	ug/L	846	11/04/1992	cdl
Styrene	<5.0	ug/L	846	11/04/1992	cdl
1,1,2,2-Tetrachloroethane	<5.0	ug/L	846	11/04/1992	cdl
Tetrachloroethene	<5.0	ug/L	846	11/04/1992	cdl
Toluene	<5.0	ug/L	846	11/04/1992	cdl
1,1,1-Trichloroethane	<5.0	ug/L	846	11/04/1992	cdl
1,1,2-Trichloroethane	<5.0	ug/L	846	11/04/1992	cdl
Trichloroethene	<5.0	ug/L	846	11/04/1992	cdl
Trichlorofluoromethane	<5.0	ug/L	846	11/04/1992	cdl
Vinyl Acetate	<5.0	ug/L	846	11/04/1992	cdl
Vinyl Chloride	<5.0	ug/L	846	11/04/1992	cdl
m-Xylene	<5.0	ug/L	846	11/04/1992	cdl
o-Xylene	<5.0	ug/L	846	11/04/1992	cdl
p-Xylene	<5.0	ug/L	846	11/04/1992	cdl

NET Cambridge Division
QUALITY CONTROL DATA

Report To: ICF Kaiser Engineers — NET Job No: 92.34511

Project: PPG RUSH SOIL VOAs — Report Date: 11/10/1992

Matrix Spike/Matrix Spike Duplicate Results

Compound	Spike Amount	Sample Result	Units	MS Result	MS % Recovery	MSD Result	MSD % Recovery	RPD
TCL Volatiles by GC/MS 8240 S								
Acetone	0.0	<5.0	ug/Kg					
Benzene	50.0	<5.0	ug/Kg	54.1	108.20	45.2	90.40	17.80
Bromodichloromethane	0.0	<5.0	ug/Kg					
Bromoform	0.0	<5.0	ug/Kg					
Bromomethane	0.0	<5.0	ug/Kg					
2-Butanone (MEK)	0.0	<5.0	ug/Kg					
Carbon Disulfide	0.0	<5.0	ug/Kg					
Carbon Tetrachloride	0.0	<5.0	ug/Kg					
Chlorobenzene	50.0	<5.0	ug/Kg	47.4	94.80	38.8	77.60	20.00
Chloroethane	0.0	<5.0	ug/Kg					
2-Chloroethylvinyl ether	0.0	<5.0	ug/Kg					
Chloroform	0.0	<5.0	ug/Kg					
Chloromethane	0.0	<5.0	ug/Kg					
Dibromochloromethane	0.0	<5.0	ug/Kg					
1,2-Dichlorobenzene	0.0	<5.0	ug/Kg					
1,3-Dichlorobenzene	0.0	<5.0	ug/Kg					
1,4-Dichlorobenzene	0.0	<5.0	ug/Kg					
1,1-Dichloroethane	0.0	<5.0	ug/Kg					
1,2-Dichloroethane	0.0	<5.0	ug/Kg					
1,1-Dichloroethene	54.3	12	ug/Kg	66	99.40	43.8	58.60	51.60
trans-1,2-Dichloroethene	0.0	<5.0	ug/Kg					
1,2-Dichloropropane	0.0	<5.0	ug/Kg					
cis-1,3-Dichloropropene	0.0	<5.0	ug/Kg					
trans-1,3-Dichloropropene	0.0	<5.0	ug/Kg					
Ethylbenzene	0.0	<5.0	ug/Kg					
2-Hexanone	0.0	<5.0	ug/Kg					
4-Methyl-2-pentanone (MIBK	0.0	<5.0	ug/Kg					
Methylene Chloride	0.0	<5.0	ug/Kg					
Styrene	0.0	<5.0	ug/Kg					
1,1,2,2-Tetrachloroethane	0.0	<5.0	ug/Kg					
Tetrachloroethene	0.0	<5.0	ug/Kg					
Toluene	50.0	<5.0	ug/Kg	61.0	122.00	45.6	91.20	28.80
1,1,1-Trichloroethane	0.0	<5.0	ug/Kg					
1,1,2-Trichloroethane	0.0	<5.0	ug/Kg					
Trichloroethene	50.0	<5.0	ug/Kg	36.7	73.40	31.0	62.00	16.80
Trichlorofluoromethane	0.0	<5.0	ug/Kg					
Vinyl Acetate	0.0	<5.0	ug/Kg					
Vinyl Chloride	0.0	<5.0	ug/Kg					
m-Xylene	0.0	<5.0	ug/Kg					
o-Xylene	0.0	<5.0	ug/Kg					
p-Xylene	0.0	<5.0	ug/Kg					

NOTE: Data reported for spiked samples were analyzed in the same batch, but may not necessarily be that of your sample.

ICF KAISER ENGINEERS

CHAIN OF CUSTODY RECORD

Order #923511 3358

PROJ. NO.	PROJECT NAME
04512-001-00	PPG Circleville RCRA Closure

SAMPLERS: *(Signature)* W. Douglas Weeks Jr.

NO. OF CONTAINERS | RUSH 5 Day TA

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	RUSH 5 Day TA						REMARKS
CV-92-0524-I24	10/31/92	1025		X	Incinerator PAD	1	X						Analyze for VOCs using
CV-92-0525-I45	10/31	1040		X	Incinerator PAD	1	X						EPA-SW-846 Method 8240
CV-92-0526-S100	10/31	1108		X	SOUTH PAD	1	X						
CV-92-0527-W6	10/31	1145		X	WEST PAD	1	X						
CV-92-0528-W44	10/31	1130		X	WEST PAD	1	X						
CV-92-0529-FBW	10/31	1155		X	WEST PAD	2	X						

Relinquished by: *(Signature)*	Date/Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date/Time	Received by: *(Signature)*
W. Douglas Weeks Jr.	10/31/92 1245	To Accurate Carrier		11/2/92 11:15	[illegible signature]
Relinquished by: *(Signature)*	Date/Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date/Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date/Time	Received for Laboratory by: *(Signature)*	Date/Time	Remarks	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

ATTACHMENT D

PPG Circleville Plant Safety Rules and Instructions

CIRCLEVILLE PLANT
SAFETY RULES
AND
INSTRUCTIONS

1. The PPG Plant in Circleville is a manufacturer of Plastics and Resins. As a result, the products which are most used in the plant are paint thinners and solvents which are highly flammable. The possible presence of solvent vapors must always be considered during all phases of construction. In view of these hazards, the following safety rules are established:

   A. No smoking anywhere on the premises except those areas which are especially designated.

   B. Strike Anywhere Matches (Kitchen Matches) are not allowed in the plant.

   C. No open flames, electric welding, or soldering without permission of the plant Engineering Department. Permissions for an open flame is not permission to smoke. Do not carry flint strikers for gas torches into hazardous areas. Use spark proof tolls and explosion proof equipment where needed. Use safety flashlights only.

   D. Before welding, drilling or use of non-explosive proof equipment, a permit must be secured from the Engineering Office and signed by the Safety Department and Area Supervisor before job can be started.

   E. No use of spark-causing reciprocating equipment; e.g., chisels, saws, hammers, etc., without permission of the Plant Engineering Department.

   F. All equipment must be in first class condition.

   G. Post signs or rope areas off when working overhead.

   H. When announced over P.A. system that additions are being made to the kettles, evacuate 2nd and 3rd floor MR & RD areas until all clear is announced.

   I. Stay clear of areas marked "75-10 in use;" this is a cleaning compounds that makes floors slippery and can cause severe burns.

   J. Ground cables for welding should be attached directly to work piece rather than using plant structure for ground.

   K. Violations of Safety Rules constitute breach of contract and is cause for removal of Contractor. Also constitutes immediate discharge of employee or employees guilty of safety violation.

   L. Do not wear metal soled or heeled shoes or shoes with a metal cap or plate attached.

   M. Do not horseplay.

   N. Do not block fire extinguishers, exists, or alarm boxes.

   O. Do not use packages or drums in place of ladders.

   P. Do not jump from docks, trucks or platforms.

   Q. Eat lunch in lunch area only. We suggest washing the hands before eating.

   R. Report any malfunction or potential safety hazards to your foreman or superintendent.

   S. Housekeeping is part of your job.

2. When cutting into a pipe line or vessel, always know the code number of material that the pipe line or vessel has been used for. If you should accidentally get splashed, remove saturated clothing and flush the affected area of body with water for ten (10) minutes. Do not put saturated clothes or shoes back on unless you are advised to do so. Report incident with code number to your immediate foreman or superintendent and ask him to contact someone from PPG and they will supply information for additional treatment if needed.

3. The parking of contractor's cars or trucks within the plant will not be permitted without approval of the plant Engineering Department.

4. Safety glasses and hard hats must be worn at all times within the fenced area, unless you are in the cafeteria of one of the designated break areas.

5. When a fire alarm sounds, leave work area and go to parking lot until all clear. If you see smoke or fire, turn in alarm and proceed to outside area. Our fire alarm is a horn blast for 10 seconds, followed by a voice annunciation over the public address system identifying the zone of origin. The "All Clear" will be announced orally over the same public address system.

ATTACHMENT E

Risk Assessment

RISK ASSESSMENT

FOR
RCRA PARTIAL CLOSURE

prepared for

PPG INDUSTRIES, INC.
COATINGS AND RESINS DIVISION
Circleville, Ohio

prepared by

ICF KAISER ENGINEERS, INC.
Four Gateway Center
Pittsburgh, Pennsylvania 15222

February 18, 1993

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

List of Figures

List of Tables

TABLE OF CONTENTS (Continued)

List of Tables (Continued)

EXECUTIVE SUMMARY

This human health risk assessment was conducted in support of the RCRA partial closure requirements for three interim status hazardous waste management units at the PPG Industries, Inc. Coatings and Resins Division in Circleville, Ohio and is a companion document to the Partial Closure Plan by ICF Kaiser Engineers (ICF KE). The report was prepared according to the standards specified by the Ohio Environmental Protection Agency (OEPA) in the "Closure Plan Guidance Manual" dated May 1, 1991. Approaches recommended by the United States Environmental Protection Agency (U.S. EPA) in the "Risk Assessment Guidance for Superfund" and successor documents are also followed. The results of the risk assessment indicate that the units may be closed in a manner that eliminates the need for further maintenance and concern over post-closure escape of residual chemicals. Thus, the risk assessment provides criteria to confirm that the remaining low level residuals do not pose a threat to public health.

The three interim status hazardous waste management units addressed in this risk assessment are the Incinerator area, South Pad area and West Pad area. Data regarding the environmental conditions in these areas were obtained from the sampling and analyses performed by ICF KE and other contractors in 1989 and 1992. Based on these investigations, the chemicals of concern for the three areas consist of methylene chloride, ethylbenzene, xylene, methylisobutyl ketone (MIBK), toluene and methanol. In conforming with OEPA requirements, maximum concentrations of chemicals detected were incorporated into the risk assessment.

Specified hypothetical receptors include a residential adult and a residential child. The following exposure pathways were evaluated quantitatively according to OEPA guidance: ingestion of chemicals in soil; dermal contact with chemicals in soil; ingestion of chemicals in groundwater; dermal contact with chemicals in groundwater; inhalation of chemicals associated with airborne particulates originating from the units; inhalation of volatile chemicals from soil; and inhalation of volatile chemicals from water during showering or bathing. Exposure factors as specified by the OEPA were utilized, despite the fact that these are inconsistent with reasonable exposure conditions. *It is important to note that the groundwater exposure pathway and calculated risks are included for information purposes only since TCLP data have yet to be obtained.* For definition of acceptable dose standards, U.S. EPA reference doses and cancer slope factors were incorporated into the calculations from the Integrated Risk Information System (IRIS).

For each unit, summed noncarcinogenic hazards are within the acceptable limits (less than one) established by the OEPA. Summed theoretical excess lifetime cancer risks are also within the OEPA RCRA closure requirements of one in one million. Many factors incorporated into this risk assessment to comply with OEPA requirements utilize overconservatisms for the exposure assumptions, and overestimate noncancer hazards and theoretical excess lifetime cancer risks. Approaches for incorporating animal to human dose extrapolation and high-to-low dose extrapolation include conservatisms which are inherent in the U.S. EPA recommended risk assessment process. The OEPA approach further compounds these overconservatisms by requiring the incorporation of the highest detected value for each chemical into the risk assessment, excessive duration and frequency of exposure conditions, and the prohibition of environmental fate and transport factors, particularly for groundwater. Although these considerations are not necessarily consistent with the U.S. EPA's reasonable maximum exposure concept and reflect a scenario not achievable under actual conditions, they have been incorporated in this risk assessment.

The conclusion of this assessment is that summed noncarcinogenic hazards and summed theoretical excess lifetime cancer risks associated with the site constituents in each of the areas of concern are considered acceptable according to OEPA RCRA closure requirements. No post-closure maintenance is recommended.

1.0 INTRODUCTION

This risk assessment was prepared by ICF Kaiser Engineers, Inc. (ICF KE) for PPG Industries, Inc., Coatings and Resins Division, Circleville, Ohio in support of the implementation of the Partial Closure Plan for three interim status hazardous waste management units. This report is prepared in compliance with Ohio EPA's (OEPA) Closure Plan Guidance Manual (1991) despite the fact that some of the required approaches are unachievable under actual conditions. Approaches recommended by the U.S. EPA (1989a; 1989b) are also incorporated. The document is designed to identify non-cancer hazards and theoretical excess lifetime cancer risks associated with current site conditions. This document is intended to function as a companion document to the Partial Closure Plan by ICF KE, dated February, 1993. As such, the sampling and analytical data incorporated into this report are derived from that source. *It is important to note that the groundwater exposure pathway and calculated risks are included for informational purposes only since TCLP data have yet to be obtained.*

1.1 PURPOSE OF THE RISK ASSESSMENT

Risk assessment is defined as the scientific evaluation of human and environmental health impacts posed by a particular substance or mixture of substances. The purpose of this risk assessment is to provide a quantitative analysis, in a manner consistent with the required approaches of the OEPA, of the likelihood of adverse effects associated with potential residential exposures to chemicals in environmental media in the units.

Specific objectives of this risk assessment are:

- to provide an analysis of baseline risks according to OEPA requirements;
- to provide a basis for determining levels of chemicals that can remain onsite and still be adequately protective of public health; and
- to provide a consistent process of evaluating and documenting public health protective measures.

To achieve these goals, the scientific basis and validity of values incorporated into the assessment are considered and discussed in the context of primary research literature in order to provide a frame of reference for the conclusions.

1.2 APPROACH

The organization of this risk assessment follows the guidelines originally prepared by the National Academy of Sciences (NAS, 1983), which suggest that risk assessments should contain some or all of the following four steps:

- **Hazard Identification (Identification of Chemicals of Concern).** The focus of this step is to evaluate site investigation data, and identify chemicals of concern;

- **Dose-Response Assessment (Toxicity Assessment).** This step involves the determination of the relation between the magnitude of exposure (dose) and the probability of occurrence (response) of adverse health effects associated with the chemicals of concern;

- **Exposure Assessment.** Identification of the receptors likely to be exposed to the chemicals and the extent of their exposure under defined exposure scenarios; and

- **Risk Characterization.** Description of the nature and the magnitude of non-cancer health risk and theoretical excess lifetime cancer risks, including attendant uncertainty, comparisons to typical risks encountered from other sources, and evaluation of the necessity for remedial action.

1.3 REPORT ORGANIZATION

This report is organized in a manner consistent with the above mentioned sections of a risk assessment. The sections of the report are described below:

- Section 1 provides an introduction to the report.

- Section 2 describes the areas of concern at the site and the chemicals of concern in those areas.

- Section 3 describes the theoretical basis for derivation of health criteria for the chemicals of concern and presents the specific health criteria and their bases.

- Section 4 presents the likely human receptors of concern and utilizes defined exposure factors to estimate the magnitude of exposure of those receptors to the chemicals of concern.

- Section 5 presents the results of the analysis in which the risks associated with the defined exposures are quantified and summarized.

- Section 6 describes the uncertainties associated with the exposures and risks calculated.

- Section 7 presents the conclusions of the report.

- Section 8 presents the references used in the report.

2.0 IDENTIFICATION OF CHEMICALS OF CONCERN

This section presents the basis for identification and selection of the chemicals of concern. In addition, the representative concentrations of each of the chemicals of concern and their distribution in each area of concern are also presented.

2.1 SITE BACKGROUND

PPG owns and operates a resin manufacturing facility located on Pittsburgh Road approximately two miles south of Circleville, Pickaway County, Ohio. Resins produced at the facility are used in paints and industrial coatings serving a variety of commercial industries. The surrounding area is classified as industrial and agricultural. Eight major buildings are located on the property of this facility, which encompasses approximately sixty acres. The general topography of the area is flat. The nearest residential development is approximately one-half mile from the plant boundary.

The facility previously was permitted under Interim Status to store wastes in drums and tanks and to treat liquids by incineration. The incinerator operated for approximately seventeen years (1971-1988) and drum storage pads were used for periods of five to twenty-four years. In 1987, a larger incinerator, the Energy Recovery Unit (ERU), began operation at the Circleville facility. The ERU currently receives PPG waste materials from plants in North America and processes them for incineration.

Following the startup and operation of the ERU at the Circleville site, the drum storage pads (West and South pads) and Liquid Waste Incinerator were no longer used. The Liquid Waste Incinerator and the drum storage pads were closed in 1989 in accordance with Interim Status regulatory requirements and as documented in the Partial Closure Plan. Closure of the three units included cleaning or removal of the concrete pads and the underlying soils and removal and disposal of the incinerator.

2.2 DESCRIPTION OF AREAS OF CONCERN

The descriptions of the units are based in part on information contained in the RCRA Interim Status permit and are presented below. The former locations of the Liquid Waste Incinerator, West Pad and South Pad are indicated on Figure 1.

2.2.1 Liquid Waste Incinerator

This unit consisted of a liquid waste incinerator with three lines (two for organic wastes and one for aqueous wastes), which fed wastes to the hearth. The incinerator area included a concrete containment area located southeast of the incinerator pad. Waste characterization for those materials treated in the incinerator included the following:

D001: Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methylisobutyl ketone, methanol, toluene or methyl ethyl ketone);

F003: Still sludge including xylene, ethylbenzene and methylisobutyl ketone; and

F005: Still sludge including toluene and methyl ethyl ketone.

The previous Partial Closure Plan submitted to OEPA included methanol as a component of the F003 waste listing. However, the methanol treated at the facility was only associated with the waste resin material (D001).

2.2.2 Drum Storage Area; South Pad

This unit consisted of a flat, packed gravel area approximately 90 feet by 240 feet. This area contained a consolidation platform with a concrete containment pad underneath. The pad had been in use since 1976. Wastes stored in this area included the following:

D001: Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methylisobutyl ketone, methanol, toluene or methyl ethyl ketone).

2.2.3 Drum Storage Area; West Pad

This unit consisted of a flat area covered by packed gravel. The storage pad was approximately 10 feet by 100 feet. This unit was in use from 1975 to 1985. Wastes stored in this area included the following:

D001: Waste Resin (alkyd, acrylic, polyester or epoxy polymers, dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methylisobutyl ketone, methanol, toluene or methyl ethyl ketone);

F002: Spent methylene chloride.

2.2.4 Drum Storage Area; Still Pad

Still Pad decontamination rinseate sample results were below standards identified in OEPA's Closure Plan Review Guidance. Documentation exists to conclude that the presence of constituents of concern in subsurface soils are not related to RCRA management activities at the Still Pad. During Phase III of PPG's PCB remediation project, the Still Pad as well as contaminated storm sewers and manholes and the surface concrete in the Plant's East yard were removed and replaced.

2.3 DATA COLLECTION

Sampling methods and equipment, as well as laboratory analytical methods, followed U.S. EPA's publication, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846). Soil sampling results from 1989 and 1992 sampling events are included in Appendix A. The results of the sampling and analyses are presented as follows:

2.3.1 Incinerator Area

The soil around the incinerator was tested in 1989 for the constituents listed below. The representative sample points indicated on the sampling grids in this plan were developed using SW-846 protocol and a random number generator. If two points were adjacent, the next number was used. If concrete or a structure interfered with the sample location, the grid next to the location was used. A power auger was used to remove the top four to six inches of soil. The loose soil was removed and a grab sample was collected using a tongue depressor where necessary to loosen the soil. The samples were placed in clean glass 40 milliliter (ml) vials with Teflon septa.

The soil samples were analyzed for the complete Hazardous Substance List (HSL) volatiles according to SW-846 Method 8240. In addition, methanol, n-butanol and isobutanol were analyzed according to SW-846 Methods 5030 and 8015.

2.3.2 South Pad

Analyses for HSL volatile organics and alcohols were performed in 1989 as described in the previous section. Two composite soil samples made up of all 48 soil samples from the area were analyzed for PCBs according to SW-846 Method 8080.

2.3.3 West Pad

Analyses for HSL volatile organics and alcohols were performed in 1989 as described in Section 2.3.1. One composite soil sample made up of all nine soil samples from the area was analyzed for PCBs according to SW-846 Method 8080.

2.4 IDENTIFICATION OF CHEMICALS OF CONCERN

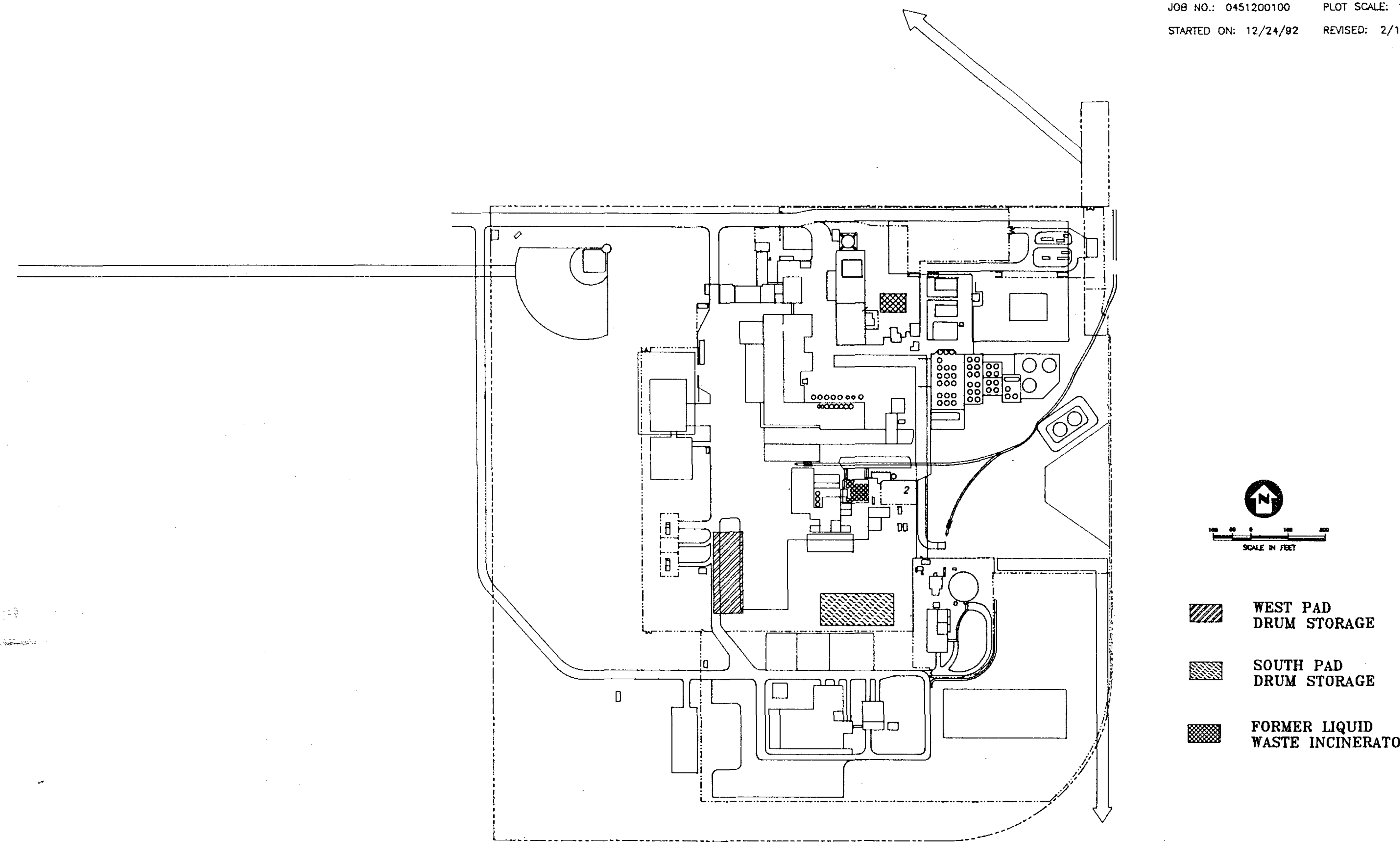
As required by OEPA, chemicals which were detected in each area during the sampling efforts described above were incorporated into this risk assessment. The chemicals of concern for each unit are presented in Table 2-1.

2.5 REPRESENTATIVE CONCENTRATIONS OF CHEMICALS OF CONCERN

As required by OEPA, the representative chemical concentrations for the constituents of concern for use in this risk assessment were taken as the highest detected value in each unit. These values are presented in Table 2-2. As required, the maximum concentration detected at any one grid point was used to quantify the exposure from soil, air and water in each unit.

JOB NO.: 0451200100 PLOT SCALE: 1=4000

STARTED ON: 12/24/92 REVISED: 2/18/93



REFERENCE: ENGINEERING-SCIENCE
DRAWING CL425.08
SOIL ASSEMENT REPORT
4/24/1991

	FIGURE 1
PPG INDUSTRIES, INC. CIRCLEVILLE, OHIO	AREAS OF CONCERN FOR PARTIAL RCRA CLOSURE
ICF KAISER ENGINEERS PITTSBURGH, PA	DATE: 12/24/92 DR.: B. SNYDER SCALE: N.T.S. DWG. NO. 04512-B1

TABLE 2-1

SUMMARY OF CHEMICALS OF CONCERN

Area Description	Chemicals of Concern
Incinerator Area	*Xylene* *Ethylbenzene* *Methylene Chloride*
South Pad	Xylene Ethylbenzene Methylisobutyl Ketone (MIBK) Toluene Methylene Chloride
West Pad	Xylene Ethylbenzene Methanol Toluene

See Figure 1 for the location of each area of concern.

TABLE 2-2

MAXIMUM DETECTED CHEMICAL CONCENTRATIONS

CHEMICAL	AREA		
	Incinerator Area	South Pad	West Pad
Xylene	4.0	8.0[1]	2.2
Ethylbenzene	2.0	2.0	0.229
MIBK	ND (<.005)	0.006	ND[2] (<.005)
Methanol	ND (<.968)	ND (<.968)	0.968
Toluene	ND (<.190)	21.0	1.34
Methylene Chloride	4.0	3.0	ND (<.300)

[1] Values are in parts per million (ppm).

[2] ND - Chemical was not detected in this area. Detection limits are listed for non-detects.

3.0 DOSE-RESPONSE ASSESSMENT

Dose-response assessment is the process of characterizing the relationship between the dose of a chemical and the anticipated incidence of an adverse health effect (Preuss and Ehrlich, 1987). The majority of existing knowledge about the dose-response relationship is based on data collected from animal studies (usually rodents) or human occupational exposures, and the theory about what might occur in humans after exposure to environmental doses.

The U.S. EPA has developed dose-response assessment techniques to set "acceptable" levels of human exposure to chemicals in the environment. These U.S. EPA-derived risk criteria address both potential carcinogenic and chronic noncarcinogenic adverse health effects. The following section discusses the derivation of the acceptable dose levels, the manner in which these levels are used in this risk assessment, and the limitations of these values. The limitations are addressed in greater detail in the uncertainty section (Section 6.0).

3.1 BACKGROUND ON NONCARCINOGENIC RESPONSE

It is widely accepted that non-cancer biological effects of chemical substances occur only after a threshold dose is achieved (Klaasen et. al., 1986). For the purposes of establishing non-cancer criteria, this threshold dose is usually estimated from the no observed adverse effect level (NOAEL) or the lowest observed adverse effect level (LOAEL) determined from chronic animal studies. The NOAEL is defined as the highest dose at which no adverse effects occur, while the LOAEL is defined as the lowest dose at which adverse effects are discernable.

NOAELs and LOAELs derived from animal studies or human data are used by the U.S. EPA to establish reference doses (RfDs) for human exposure. An RfD is a dose which is not expected to exceed an acceptable level of noncarcinogenic risk over a set duration of exposure. Uncertainty factors are incorporated into RfDs in an attempt to account for limitations in the quality or quantity of available data.

3.2 ESTIMATING THE LIKELIHOOD OF ADVERSE NONCARCINOGENIC RESPONSE

The dose is the estimated amount of chemical received by the receptor. The relationship between the RfD and the received dose defines the likelihood of occurrence of adverse effects. Doses less than the RfD are not likely to be associated with any adverse health effects and are, generally, not of regulatory concern. Doses which exceed the RfD are considered to present the potential for adverse effects. Values associated with noncarcinogenic exposures are summed at the initial screening level. The relationship is expressed numerically using parameters known as the hazard value (HV) and hazard index (HI). The hazard value is obtained by dividing the average daily dose (ADD) by the RfD as presented below. The ADD is the estimated daily dose of a chemical associated with a situation-specific duration of exposure, which may not necessarily be an entire lifetime.

$$ADD / RfD = HV$$

Each dose calculation, or combination of chemical, receptor, and exposure pathway will have a distinct hazard value. The sum of the HVs for each receptor will yield the HI, as indicated:

$$HVi + HVii + HViii + ... = HI$$

An HI value of less than one indicates that an adverse effect would not be anticipated.

3.3 BACKGROUND ON CARCINOGENIC RESPONSE

The U.S. EPA has typically required that chemicals which are carcinogenic be treated as if minimum thresholds do not exist (U.S. EPA, 1986a, 1986b). The dose-response curve for carcinogens used for regulatory purposes only allows for zero risk at zero dose. Thus, for all doses, some risk is assumed to be present. To estimate the theoretical response at environmental doses, various mathematical dose-response models are used. The accuracy of the projected risk at the low environmental doses is a function of how accurately the mathematical model reflects the relationship between dose and risk at the low dose levels. The U.S. EPA uses the linearized multistage model for low dose extrapolation (Munro and Krewski, 1981). This model assumes that the effect of the carcinogenic agent on tumor formation as seen at high doses in animal data is basically the same at low doses (i.e., the slope of the dose-response curve can be extrapolated downward to the origin in a linear manner).

The U.S. EPA applied the linearized multistage model, as recommended by the Carcinogen Risk Assessment Guidelines (U.S. EPA, 1986b), to develop the upperbound estimate of the risk for the chemicals considered carcinogenic. The numerical expression of carcinogenic potency of a chemical calculated by this method is known as the "Q star", written as Q_1*. The Q_1* usually represents the slope of a dose-response curve derived from animal studies, but may also be based on human epidemiology. The slope is the change in tumor incidence (Y axis) over the change in dose (X axis). Thus, the units in a Q_1* value are tumor incidence over dose level, with dose (the denominator) in milligrams of chemical per kilogram of body weight-day ($Q_1^* = (\text{mg/kg-day})^{-1}$).

3.4 ESTIMATING THE LIKELIHOOD OF CARCINOGENIC RESPONSE

In order to estimate the theoretical excess lifetime carcinogenic risk associated with exposure to a chemical, the product of the medium-specific (ingestion, inhalation) carcinogenicity slope factor (CSF) and lifetime average daily dose (LADD) estimated for each exposure pathway of concern is determined. The calculation of the theoretical excess lifetime cancer risk is then:

$$LADD \times CSF = Risk.$$

3.5 BENCHMARK VALUES FOR CHEMICALS OF CONCERN

The RfDs and CSFs and descriptions of the principal studies on which they are based are presented below for each of the chemicals of concern found at the site. These values are summarized in Table 3-1 and are based on the most recent U.S. EPA Integrated Risk Information System (IRIS) toxicity assessments (1992a). For MIBK, the values used for the reference doses are based on the Health Effects Assessment Summary Tables (U.S. EPA, 1991, 1992b) since the health risk assessment information contained in IRIS is not finalized.

Principal studies are those that contribute most significantly to the qualitative assessment. Principal studies are of two types: studies of human populations (epidemiologic investigations) and studies using laboratory animals. The presence of human data obviates the necessity of extrapolating from animals to humans. Therefore, human studies, when available, are given first priority. However, for most chemicals, there is a lack of appropriate information on effects in humans. In these cases, the principal studies are drawn from experiments on rats, mice or similar species.

■ METHYLENE CHLORIDE

Methylene chloride has been classified by the U.S. EPA as a probable human carcinogen (Group B2). IRIS (U.S. EPA, 1992a) provides cancer potency estimates for both the oral and inhalation routes of exposure. IRIS also provides an oral reference dose for methylene chloride. *The Health Effects Assessment Summary Tables (U.S. EPA, 1992b) provide an inhalation reference concentration.*

-- Derivation of the Oral Cancer Slope Factor

IRIS presents the 10^{-6} risk-specific dose of methylene chloride as 7.5 x 10^{-3} $(mg/kg\text{-}day)^{-1}$. Neither of the studies of chemical factory workers exposed to methylene chloride showed an excess of cancers (Ott et al., 1983; Friendlander et al., 1978; Hearne and Friendlander, 1981). The Ott et al. (1983) study was designed to examine cardiovascular effects, and consequently the study period was too short to allow for latency of site-specific cancers. The Friendlander et al. (1978) study was recently updated to include a larger cohort, followed through 1984, and an investigation of possible confounding factors (Hearne et al., 1986, 1987). A nonsignificant increase in pancreatic cancer deaths was reported. This was interpreted by U.S. EPA (1987) as neither clear evidence of carcinogenicity in humans, nor evidence of noncarcinogenicity. Lifetime exposure at high toxic doses in animal studies have indicated carcinogenic effects from both oral and inhalation exposure to methylene chloride (NCA, 1982, 1983). Two inhalation studies with methylene chloride have reported an increased incidence of benign mammary tumors in both sexes of Sprague-Dawley (Burek et al., 1984) and F344 (NTP, 1986a) rats. Male Sprague-Dawley rats were reported to have increased salivary gland sarcoma (Burek et al., 1984) and female F344 rats were reported to have increased leukemia incidence (NTP, 1986a).

-- Derivation of the Inhalation Cancer Slope Factor

IRIS presents the inhalation unit risk for methylene chloride as 4.7 x 10^{-7} ug/m^3. Conversion of this factor to an inhalation cancer slope factor yields a value of 1.6 x 10^{-3} $(mg/kg\text{-}day)^{-1}$. The slope factor was calculated assuming a 70 kg human body weight, 20 m^3 air inhaled per day and 100% absorption of inhaled methylene chloride.

A number of studies have been conducted to determine the potential for carcinogenicity of methylene chloride. The data are equivocal due to varying experimental design and quality, however a number of studies which were conducted for lifetime exposures at high doses have reported positive results (Burek et al., 1984; Dow Chemical Co., 1982).

-- Derivation of the Chronic Oral Reference Dose

The RfD for methylene chloride is 6.0 x 10^{-2} mg/kg-day (U.S. EPA, 1992a). This value was derived from a 24-month chronic toxicity and oncogenicity study of methylene chloride in rats.

The chosen study was conducted with 85 rats/sex at each of four nominal dose groups (i.e., 5, 50, 125 and 250 mg/kg-day) for 2 years. A high-dose recovery group of 25 rats/sex, as well as two control groups of 85 to 50 rats/sex, was also tested. Many effects were monitored. Treatment related histological alterations of the liver were evident at nominal doses of 50 mg/kg-day or higher. The low nominal dose of 5 mg/kg-day was chosen as the NOAEL (NCA, 1982).

-- *Derivation of the Inhalation Reference Dose*

HEAST (1992) lists a chronic reference concentration for methylene chloride of 3.0 mg/m^3 based on an inhalation study with rats. This concentration was converted to an inhalation reference dose of 0.86 mg/kg-day. This conversion assumes a 70 kg human body weight, 20 m^3 of air inhaled per day and 100% absorption of inhaled methylene chloride. This dose is based on a two year study in which rats were intermittently exposed to methylene chloride in air (Nitschke et al., 1988). The critical effect identified in this study was liver toxicity, and a NOAEL of 694.8 mg/m^3 was established.

■ XYLENE

Xylene is not classified as a human carcinogen by the U.S. EPA. IRIS provides an oral reference dose for the evaluation of noncancer health effects.

-- **Derivation of the Chronic Oral Reference Dose**

IRIS (U.S. EPA 1992a) lists an oral reference dose for xylene (xylenes-mixed) as 2.0 mg/kg-day based on an animal study (NTP, 1986b).

Rats and mice were given gavage doses of 0, 250, or 500 mg/kg-day (rats) and 0, 500, or 1000 mg/kg-day (mice) 5 days/week for 103 weeks. The animals were observed for clinical signs of toxicity, body weight gain, and mortality. All animals that died or were killed at sacrifice were given gross necropsy and comprehensive histologic examinations. There was a dose-related increased mortality rate in male rats, and the increase was significantly greater only in the high-dose group as compared with controls. Many of the early deaths were caused by gavage error. There were no compound-related histopathologic lesions in any of the treated rats or mice. Therefore, the high dose was chosen as the LOAEL and the low dose a NOAEL.

IRIS (U.S. EPA, 1992a) does not list an inhalation reference dose for xylene (xylenes-mixed). An inhalation reference dose of 2.0 mg/kg-day was used in this assessment based on the oral reference dose.

■ ETHYLBENZENE

Ethylbenzene is not classified as a carcinogen by the U.S. EPA (1992a). IRIS does provide an oral reference dose and inhalation reference concentration for the evaluation of noncancer health effects.

-- **Derivation of the Chronic Oral Reference Dose**

The U.S. EPA Integrated Risk Information System (1992a) lists an oral reference dose for ethylbenzene as 1.0×10^{-1} mg/kg-day based on a subchronic rat oral bioassay (Wolf et. al., 1986).

The chosen study was a rat 182-day oral bioassay in which ethylbenzene was given 5 days/week at doses of 13.6, 136, 408, or 680 mg/kg-day in olive oil gavage. The criteria considered in judging the toxic effects on the test animals were growth, mortality, appearance and behavior, hematologic findings, terminal concentration of urea nitrogen in the blood, final average organ and body weights, histopathologic findings, and bone marrow counts. The LOAEL of 408 mg/kg-day is associated with histopathologic changes in the liver and kidney.

-- **Derivation of the Inhalation Reference Dose**

IRIS lists a reference concentration for ethylbenzene as 1.0 mg/m^3 based on animal inhalation studies. Conversion of this factor to an inhalation reference dose yields a value of 0.29 mg/kg-day. The RfD was calculated assuming a 70 kg human body weight, 20 m^3 of air inhaled per day, and 100% absorption of inhaled ethylbenzene.

Inhalation reproductive toxicity studies were conducted with rats and rabbits exposed 6 to 7 hours/day, 7 days/week during days 1-19 and 1-24 of gestation, respectively, to nominal concentrations of 0, 100, or 1000 ppm (434 or 4342 mg/m^3; Andrew and Bushbom, 1981). A separate group of rats was exposed pregestationally for 3 weeks prior to mating and exposure was continued into the gestational period. The results of the rabbit study led to the selection of a NOAEL of 100 ppm based on a lack of developmental effects in the animals.

■ METHANOL

Methanol is not considered a carcinogenic chemical by the U.S. EPA (1992a). IRIS provides an oral reference dose for the evaluation of noncancer health effects.

-- **Derivation of the Chronic Oral Reference Dose**

The U.S. EPA Integrated Risk Information System (1992a) lists an oral reference dose for methanol as 5.0 x 10^{-1} mg/kg-day based on animal studies. IRIS does not list an inhalation reference dose for methanol. An inhalation reference dose of 5.0 x 10^{-1} mg/kg-day was used in this risk assessment based on the oral reference dose.

The U.S. EPA Office of Solid Waste, under the RCRA Land Disposal Ban, sponsored the 90-day subchronic testing of methanol in rats (U.S. EPA, 1986c). Rats were gavaged daily with 0, 100, 500, or 2500 mg/kg-day of methanol. There were no differences between dosed animals and controls in body weight gain, food consumption, gross or microscopic evaluations. Elevated levels of SPGT, and increased, but not statistically significant, liver weights in both male and female rats suggest possible treatment-related effects in rats dosed with 2500 mg methanol/kg/day despite the absence of supportive histopathologic lesions in the liver. Based on these findings, 500 mg/kg-day of methanol was selected as a NOAEL in rats.

■ TOLUENE

The U.S. EPA has not classified toluene as a human carcinogen. IRIS lists both an oral reference dose and inhalation reference concentration for this chemical.

-- Derivation of the Chronic Oral Reference Dose

IRIS (U.S. EPA, 1992a) lists an oral reference dose for toluene as 0.2 mg/kg-day based on a National Toxicology Program study (NTP, 1989).

A subchronic gavage study was conducted in rats. Rats received toluene in corn oil at dosage levels of 0, 312, 625, 1250, 2500, or 5000 mg/kg-day. The NOAEL for this study is 312 mg/kg-day based on liver and kidney weight changes in male rats at 625 mg/kg. Because the exposure was for 5 days/week, this dose is converted to 312 x 5/7 = 223 mg/kg. The LOAEL is 625 mg/kg, which is 446 mg/kg-day when converted.

-- Derivation of the Inhalation Reference Dose

IRIS lists an inhalation reference concentration for toluene of 0.4 mg/m^3 based on an occupational study. Conversion of this concentration to an inhalation reference dose yields 0.11 mg/kg-day.

Foo et al. (1990) conducted a cross-sectional study involving 30 exposed female workers employed at an electronic assembly plant where toluene was emitted from glue. Toluene levels reported in the study were from personal monitoring. Exposed workers breathed toluene air levels of 88 ppm and control workers 13 ppm. Eight neurobehavioral tests were administered to all exposed and control workers. Group means revealed statistically significant differences in six out of eight tests; all tests showed that the exposed workers performed poorly compared with the control cohort. Based on the Foo study, a LOAEL of 88 ppm was established based on neurobiological changes from chronic exposure.

■ METHYLISOBUTYL KETONE (MIBK)

-- Derivation of the Chronic Oral Reference Dose

The Health Effects Assessment Summary Tables (U.S. EPA, 1991, 1992b) list a chronic oral reference dose for methylisobutyl ketone as 5.0×10^{-2} mg/kg-day and an inhalation reference dose as 2.0×10^{-2} mg/kg-day. The oral and inhalation reference doses for MIBK are under review by an EPA work group. Therefore, health risk information contained in IRIS is not currently available. MIBK is not listed as a suspect or defined carcinogen in either IRIS or HEAST.

TABLE 3-1

BENCHMARK VALUES FOR CHEMICALS OF CONCERN

Chemical	Oral Reference Dose (RfD)	Inhalation Reference Dose	Oral Slope Factor	Inhalation Slope Factor
	(mg/kg-day)	(mg/kg-day)	$(mg/kg\text{-}day)^{-1}$	$(mg/kg\text{-}day)^{-1}$
Xylene	2.0 E+0	2.0 E+0[1]	NA[2]	NA
Ethylbenzene	1.0 E-1	2.9 E-1	NA	NA
MIBK	5.0 E-2	2.0 E-2	NA	NA
Methanol	5.0 E-1	5.0 E-1	NA	NA
Toluene	2.0 E-1	1.1 E-1	NA	NA
Methylene Chloride	6.0 E-2	*8.6 E-1*	7.5 E-3	1.7 E-3

[1] In the absence of an inhalation reference dose, the oral reference dose was used.

[2] NA - Not Applicable; Chemical not considered to be a potential carcinogen by the USEPA.

References: U.S. EPA, 1992a. IRIS (Integrated Risk Information System). U.S. Environmental Protection Agency, Washington, D.C.

U. S. EPA, 1992b. Health Effects Assessment Summary Tables, (HEAST, 1992).

U.S. EPA, 1991. Health Effects Assessment Summary Tables, (HEAST, 1991).

4.0 EXPOSURE ASSESSMENT

Exposure assessment, as defined by the National Academy of Sciences (NAS, 1983), is the process of measuring or estimating the intensity, frequency, and duration of human exposure to an agent in the environment. "In its most complete form, exposure assessment should describe the magnitude, duration, schedule, and route of exposure; the size, nature, and classes of the populations exposed; and the uncertainties in all estimates" (NAS, 1983). Accordingly, this section of the risk assessment discusses the manner in which the chemicals of concern may be distributed in the environment and the estimated frequency of contact between potential human receptors and the chemicals. The quantitative assessment of exposure, based on the chemical concentrations present in the soil or other media of concern, and the degree of absorption of the chemical, provides the basis for estimating chemical uptake (dose) and associated health risks.

4.1 CONCEPT OF DOSE

The "Average Daily Dose" (ADD) or "Lifetime Average Daily Dose" (LADD) of each chemical is the exposure parameter of concern for long-term exposure durations, such as might be considered to occur in the area surrounding the facility. The ADD typically characterizes exposures which are relatively long in duration, such as over a working lifetime. The ADD is used as a standard measure of duration for characterizing long-term noncarcinogenic effects, and does not necessarily incorporate a lifetime duration of exposure. The LADD addresses exposures which may occur over varying durations from a single event to an average 70-year human lifetime. The LADD is an estimate of the daily dose of a chemical associated with any particular exposure situation or duration. The LADD characterizes exposures associated with evaluations of the likelihood of occurrence of carcinogenic endpoints.

4.2 EXPOSURE DOSE AND ABSORPTION

The ADD or LADD that would be received by the receptor is estimated from exposure and absorption. *According to the U.S.EPA (1989), exposure is defined as contact of a receptor to a chemical or physical agent.* The level of risk associated with exposure to a chemical is always dependent on the degree of systemic absorption or uptake (i.e., dose). Exposure, in this case, is the product of chemical concentrations and medium-specific factors. For example, in the case of inhalation, the medium-specific factor is air volume breathed. *The LADD presents the average daily dose (considered absorbed according to U.S.EPA, 1989) of a chemical over the entire 70 year lifetime, considering the fraction of each duration unit, such as a day, week, month, or year.* After calculation of the concentrations of the chemical in each medium, the LADD for each chemical received by the receptor due to each route of exposure is calculated.

4.3 PATHWAYS AND ROUTES OF HUMAN EXPOSURE

Exposure pathways are the means through which a receptor may come into contact with a chemical in the environment (e.g., skin contact with soil containing chemicals). An exposure pathway consists of three elements: (1) a source or chemical release from a source, (2) an exposure point of potential human contact, and (3) an exposure route at the contact point. Routes of exposure describe the means through which the chemical gains entry to the body via a particular pathway (e.g., dermal absorption of a soil-bound chemical). An exposure pathway is complete when all three elements are present. In this risk assessment, exposure pathways required by the OEPA are addressed quantitatively. These exceed the typically acceptable selection of exposure pathways. The following sections address the potential pathways and routes of human exposure.

4.4 RECEPTOR AND EXPOSURE PATHWAY SELECTION

The receptors required by OEPA were evaluated in each of the units. These include a residential adult and residential child. The exposure pathways evaluated for each of the receptors were, as required by OEPA, ingestion of soil, dermal contact with soil, inhalation of particulates, inhalation of volatiles, inhalation of volatiles during showering, ingestion of groundwater as drinking water and dermal contact with groundwater.

4.5 BASIS FOR EXPOSURE FACTORS

Exposure factors used in dose calculations are OEPA required values (OEPA, 1991). Details of the sources of exposure factors are presented below.

4.5.1 Factors Used in All Pathways

The following factors are consistent across the exposure pathways considered in this assessment. The values for the exposure duration and frequency for the pathways considered are as required by OEPA.

Exposure Frequency and Duration. The exposure frequency required by OEPA is 365 days for both an adult and child residential receptor. The exposure duration is 30 years for an adult residential receptor and 6 years for a child residential receptor (OEPA, 1991).

Body Weight. The value for average body weight of an adult is 70 kg and the value for average body weight of a child is 15 kg as required by OEPA (1991).

Averaging Time. The doses for noncarcinogenic health effects are averaged over the specific period of exposure for a given receptor. Noncarcinogenic averaging times are therefore calculated by multiplying the exposure frequency and exposure duration for the receptor. Noncarcinogenic averaging times for the adult and child respectively are 10,950 days and 2,190 days. Potential carcinogenic health effects are calculated over a lifetime of exposure; therefore, the OEPA (1991) value for average lifetime, 70 years, was used resulting in a carcinogenic averaging time of 25,550 days for both adult and child receptors.

4.5.2 Factors Regarding Soil Ingestion

The following factors are incorporated into the exposure calculations of the soil ingestion pathway, as shown in Table 4-1.

Soil Ingestion Rate. Exposure to chemicals in the local environment may typically occur through ingestion of soil. For the majority of persons beyond the age of six, daily uptake of soil due to ingestion will be quite low. For the purposes of estimating exposure in this risk assessment, the OEPA (1991) required value of 100 mg/day was used to describe soil ingestion for residential adults and 200 mg/day for residential children.

4.5.3 Factors Regarding Dermal Contact with Soil

The following factors are incorporated into the exposure calculations of the pathway involving dermal contact with site soils, as presented in Table 4-2.

Skin Surface Area. Skin surface area available for dermal contact with soil for all receptors is as required by OEPA for the scenario for outdoor activities. Exposed skin areas are the arms, hands, and legs for a total of 8,620 cm^2 of exposed skin surface area for a residential adult and 3,535 cm^2 for a residential child (OEPA, 1991).

Soil Adherence Factor. Numerous studies have evaluated the amount of soil that is likely to be in contact with skin. Roels et al. (1980) showed that approximately 1.0 mg of soil per square centimeter of skin adheres to a child's hand after playing in and around the home. Similarly, Driver et al. (1989) reported a reasonable maximum adherence factor of 0.9 mg/cm^2. Despite these, the value used in this risk assessment for describing soil adherence to skin during dermal contact is 2.11 mg/cm^2 as required by OEPA (1991).

4.5.4 Factors Regarding Inhalation of Airborne Particles

The following factors are incorporated into the exposure calculations of the particulate inhalation pathway, as presented in Table 4-3.

Inhalation Rate. OEPA (1991) requires a daily inhalation rate of 20 m^3/day for residential exposures. This gives an average inhalation rate of 0.83 m^3/hour.

Exposure Time. OEPA (1991) requires that both adult and child residential exposures are 24 hours/day for 365 days per year.

4.5.5 Factors Regarding Water Pathways

The following factors are incorporated into the exposure calculations of groundwater ingestion (Table 4-4), and dermal contact with groundwater (Table 4-5).

Water Ingestion Rate. Following OEPA (1991) requirements, an adult residential receptor is assumed to ingest 2 liters of water per day and a residential child is assumed to ingest 1 liter of water per day.

Skin Surface Area. OEPA (1991) requires an average value of total body skin surface area of 18,150 cm^2 for residential adults and 7,195 cm^2 for residential children.

Exposure Time. OEPA (1991) requires an exposure time for dermal contact with chemicals in water as 0.008 hours per day.

4.5.6 Factors Regarding Inhalation of Volatiles During Showering

The following factors are incorporated into the exposure calculations of the inhalation of volatiles during showering or bathing, as presented in Table 4-6.

Inhalation Rate. OEPA (1991) requires a daily inhalation rate of 0.6 m^3/hr for residential exposure during showering.

Exposure Time. OEPA requires (1991) a daily exposure time during showering of 0.2 hours/day.

4.5.7 Factors Regarding the Inhalation of Volatiles from Soil

The following factors are incorporated into the exposure calculations of the inhalation of volatiles from soils as presented in Table 4-7.

Inhalation Rate. Ohio EPA guidance (1991) provides a daily inhalation rate of 0.83 m^3/hr for residential exposure.

Exposure Time. Ohio EPA guidance (1991) provide a daily exposure time of 24 hours/day.

4.6 CHEMICAL ABSORPTION FACTORS

Chemicals which are contained in a soil matrix and which are contacted by a human receptor are generally not completely absorbed by the receptor. A certain portion of the chemical dose to which the receptor is exposed may not actually be bioavailable. Generally an absorption factor is applied to risk calculations to account for this. Absorption factors may be applicable for gastrointestinal, dermal and respiratory routes of contact. For dermal contact in particular, the amount of chemical actually absorbed through the skin is generally much less than the total chemical dose present in soil contacting the skin. Default absorption factors of 100% have been used for gastrointestinal and respiratory absorption in this risk assessment, even though in many cases, the actual values associated with these factors are far less than 1.0. For the purposes of dermal exposure to contaminated soil, absorption factors of 25% for volatile organic chemicals, 10% for semivolatile organic compounds, and 1% for inorganic compounds (Ryan et al., 1987) are used based on OEPA guidance (1991).

4.7 DERMAL PERMEABILITY CONSTANTS

Pathways which involve dermal contact with water require the inclusion of a dermal permeability constant in the equation. This factor reflects the movement of the chemical from the water, across the skin, to the stratum corneum and into the bloodstream. Because permeability constants are based on equilibrium partitioning, they are likely to overestimate the absorbed dose of short exposure periods. Table 4-8 presents the dermal permeability constants used for the chemicals of concern in this risk assessment. The value for benzene, 0.1 cm/hr is considered representative of insoluble organic compounds and 1.5×10^{-3} is considered representative for water-soluble inorganics or metals as required by OEPA (1991) although no specific literature citation is given. The value for benzene was used as the value for MIBK because no chemical-specific value was available.

4.8 AIRBORNE PARTICULATE CONCENTRATIONS OF CHEMICALS

Receptors could be exposed through inhalation pathways to chemicals present in the air. This exposure could occur if chemicals contained in a soil matrix are inhaled as soil particulate emissions.

There are two physical phenomena which could produce soil particulate emissions at the site: wind erosion and mechanical disturbances. Wind erosion is typically considered the less significant of these two pathways and even during construction activities contributes only a minor portion to the total particulate emissions from a site (U.S. EPA, 1985). The analysis of potential air exposures assesses constituents migrating from the soils into the atmosphere. OEPA (1991) states that this demonstration should include emission calculations and "safe inhalation levels" based on U.S. EPA and OEPA established exposure levels.

In order to estimate the concentrations of airborne particulates present during construction or digging activities, a theoretical box model was utilized (U.S. EPA, 1973, 1974). The box model is a relatively simple approach which uses conservative assumptions designed to evaluate inhalation exposure to site-associated chemicals. The following conservative assumptions are incorporated into this model:

- The source is infinitely wide in the cross-wind direction;
- The receptor is in the source area at the downwind edge;
- Vertical dispersion has resulted in uniform mixing of the particles from the ground to the breathing zone; and
- No chemicals have dispersed higher than the breathing zone.

Air concentrations of particulates are calculated by assuming the particles enter a box which is the length of the downwind dimension of the area of concern and the height of an average person. The particles in this box are assumed to be uniformly distributed within it and displaced at the downwind end by fresh air moving at a speed WS (a conservative wind speed of 9000 meters/hr or 2.5 m/sec is considered for the assessment).

The box model estimates particle concentrations based on the following equation:

$$PB = GR \; x \; L \; x \; \frac{1}{WS} \; x \; \frac{1}{H}$$

Where: *PB = Particle concentration in box (mg/m³);*
GR = Particle generation rate (373 mg/m²-hr);
L = Downwind length of contaminated area (area specific);
WS = Wind speed (9000 meters/hr); and
H = Height of box (2 meters)

The factors used in the box model calculation are presented in Table 4-9.

In order to calculate the concentration of a specific chemical in the air from the concentration of particulates, a highly conservative approach is incorporated that the concentration of a chemical contained in the airborne particles is the same as the concentration in area soils, *as shown in the following equation:*

$$CA = PB \times CS \times CF$$

Where: CA = Chemical concentration in airborne particulates (mg/m^3)
PB = Particle concentration in box (mg/m^3)
CS = Chemical concentration in soil (mg/kg)
CF = Conversion factor (10^{-6} kg/mg)

Table 4-10 presents the concentration of chemicals in air as a result of particulate mobilization for each of the site areas.

4.9 GROUNDWATER CONCENTRATION OF CHEMICALS

OEPA (1991) states that levels of constituents in leachate may be estimated based on known characteristics of the constituents such as solubility and partitioning coefficients. A short-term, steady-state leaching model for organic chemicals was used to estimate the potential chemical concentrations in groundwater (Baes and Sharp, 1983). This model uses the following equation:

$$CW = \frac{C_s(o)h}{qt}\left[1 - \exp - \left[\frac{qt}{hB\ K_{oc}\ f_{oc}}\right]\right]$$

Where:

CW = Average concentration of the organic chemical leaving the soil in the leachate (ppm);

t = Duration of time interval of interest (seconds);

q = Infiltration rate of rain and snow melt (cm/sec);

h = Thickness of the soil in the unsaturated zone (cm);

$C_s(0)$ = Initial concentration (time equals 0) of the organic chemical in the soil (mg/kg);

K_{oc} = Partition coefficient for the organic compound between water and organic carbon (ml/g);

f_{oc} = Fraction of soil that is composed of organic carbon (0.031-based on silty soil; Lyman et.al., 1982);

B = Soil bulk density (1.38 g/cm^3 - based on silty soil; Morris and Johnson, 1967).

The long duration case is designed to address chronic or lifetime conditions. The long duration case determines the final concentration in the aquifer while the short duration case determines the concentration in leachate. Average aquifer concentrations for this model were determined over a year-long duration. The following equations describe the cases of short and long duration.

$$C_L = \frac{C_s}{B\ Koc\ foc}; \textit{ and}$$

$$C_w = \frac{C_s h}{qt}\ ; \textit{ which is described as}$$

$$C_w = \frac{[C_L\ x\ Q_S\ ]}{[Q_S + Q_A]}$$

Where:

C_w = Concentration in aquifer during a specified time (ppm);

C_L = Concentration in leachate during a specified time (ppm);

Q_s = Volume of water infiltrating through the soil in one year calculated as the average annual precipitation (38.0 inches per year) minus the average annual runoff (13.0 inches per year; Gerahty, et. al., 1973) multiplied by the specific sampling point area (South Pad, 200 ft^2; Incinerator Area, 90 ft^2; West Pad, 50 ft^2).

Q_A = Volume of water passing through the aquifer beneath the contaminant zone during one year, calculated by multiplying the cross-sectional area of the aquifer perpendicular to the groundwater flow direction by the groundwater flow velocity.

$$Q_A = (W \times h \times V)$$

Where:

W = Width of contaminated zone perpendicular to the flow direction (South Pad, 280 ft; Incinerator area, 120 ft; West Pad, 120 ft.).

h = thickness of the aquifer (20 ft);

V = Darcy velocity in the aquifer (V=Ci);

C = Hydraulic conductivity (1000 gallons per day per square foot; (Freeze and Cherry, 1979); and

i = Hydraulic gradient (0.00063 from Ohio area data; Geraghty et al., 1973).

This model reflects the behavior of organics in soils by assuming that chemicals originating in surface soils will migrate vertically from the point source of contamination down to the water table where the chemical will then be distributed throughout a particular zone. In this model, the size of the point source area is assumed to be the size of the sampling grid and the contaminated zone is assumed to approximate the dimensions in each unit.

Each constituent has different chemical and physical properties that control the ultimate fate and transport of the chemical in soil. In general, where organics are released into unsaturated soils, they tend to migrate vertically under the force of gravity with some slight lateral spread (Schwendeman, 1989). This migration pathway may be interrupted by adsorption to soil particles, inhibition by geologic formations or by cultural features (pipe, foundations).

The subsurface transport of chemicals is also controlled by complex interactions between chemical, physical and biological processes. Some conditions that affect migration are:

- Soil texture;
- Soil uniformity or nonuniformity (i.e., layered soils are more likely to retard migration than uniform soils);
- Soil layer configuration;
- Depth to water table;
- Soil structure;
- Flow stability; and
- Soil moisture.

These fate and transport properties were applied to the aforementioned methodology to determine whether organic compounds tend to migrate to groundwater or remain adsorbed to soil particles. Table 4-11 presents the factors used for this leaching model and the predicted maximum concentration of organic chemicals in groundwater.

4.10 CONCENTRATION OF CHEMICALS VOLATILIZING FROM SHOWER WATER

The maximum predicted concentration of volatiles that may be emitted from water during a typical shower was calculated using values of 50L of water used during showering, a shower stall volume of 2.5m^3 (Byard, 1989), 0.5 for a half-life of volatilization and a linear factor calculating average concentration. This calculation is presented in Table 4-12. Table 4-13 presents the concentration of volatiles in air as a result of showering using this predictive model.

4.11 SOIL-TO-AIR VOLATILIZATION MODEL

The volatilization factor model (VF) was used for defining the relationship between the concentration of chemicals in soil and the volatilized chemicals in air. This relationship was established as part of the Hwang and Falco (1986) model developed by EPA's Exposure Assessment Group (U.S. EPA, 1986d).

The VF presented in this section assumes that the chemical concentration in the soil is homogeneous from the soil surface to the depth of concern. This calculation is presented in Table 4-14. Factors incorporated into this model are presented in Table 4-15 and the concentration of volatile chemical emissions from soil predicted from this model are presented in Table 4-16.

TABLE 4-1

INGESTION OF CHEMICALS IN SOIL

EXPOSURE FACTORS		
Symbol	Factor	Value
CS	Chemical Concentration in Soil	Area specific (mg/kg)
IR	Ingestion Rate	100 mg/d - adult; 200 mg/d - child
CF	Conversion Factor	10^{-6} kg/mg
FI	Fraction Ingested	1.0 (unitless)
EF	Exposure Frequency	365 days/year
ED	Exposure Duration	30 yrs - adult; 6 yrs - child
BW	Body Weight	70 kg - adult; 15 kg - child
AT	Averaging Time	10,950 day - adult (NC); 2,190 day - child (NC) 25,550 day - adult and child (C)

NC - noncarcinogenic averaging time; C - carcinogenic averaging time

Calculation: Dose (mg/kg-day) = CS x IR x CF x FI x EF x ED x 1/BW x 1/AT

TABLE 4-2

DERMAL CONTACT WITH CHEMICALS IN SOIL

EXPOSURE FACTORS		
Symbol	Factor	Value
CS	Chemical Concentration in Soil	Area specific (mg/kg)
CF	Conversion Factor	10^{-6} kg/mg
SA	Skin Surface Area	8,620 cm^2 - adult; 3,535 cm^2 - child
AF	Adherence Factor	2.11 mg/cm^2
ABS	Absorption Factor	Chemical Specific[1] (unitless)
EF	Exposure Frequency	365 days/year
ED	Exposure Duration	30 yrs - adult; 6 yrs - child
BW	Body Weight	70 kg - adult; 15 kg - child
AT	Averaging Time	10,950 day - adult (NC); 2,190 day - child (NC) 25,550 day - adult and child (C)

NC - noncarcinogenic averaging time; C - carcinogenic averaging time

1 For dermal exposure to chemicals in soil, chemical-specific values are 0.25 for volatile organic compounds, 0.1 for semi-volatile organic compounds, and 0.01 for inorganic compounds (OEPA, 1991; Ryan et. al., 1987).

Calculation: Dose (mg/kg-day) = CS x CF x SA x ABS x AF x EF x ED x 1/BW x 1/AT

TABLE 4-3

INHALATION OF CHEMICALS IN AIRBORNE PARTICULATES

EXPOSURE FACTORS		
Symbol	Factor	Value
CA	Chemical Concentration in Air	Calculated (mg/m^3) with Box Model (See 4.8)
IR	Inhalation Rate	0.83 m^3/hr
ET	Exposure Time	24 hours/day
EF	Exposure Frequency	365 days/year
ED	Exposure Duration	30 yrs - adult; 6 yrs - child
BW	Body Weight	70 kg - adult; 15 kg - child
AT	Averaging Time	10,950 day - adult (NC); 2,190 day - child (NC) 25,550 day - adult and child (C)

NC - noncarcinogenic averaging time; C - carcinogenic averaging time

Calculation: Dose (mg/kg-day) = CA x IR x ET x EF x ED x 1/BW x 1/AT

TABLE 4-4

INGESTION OF CHEMICALS IN DRINKING WATER

EXPOSURE FACTORS		
Symbol	Factor	Value
CW	Chemical Concentration in Water	Calculated (mg/L) using Leachate Model (see 4.9)
IR	Ingestion Rate	2 L/day - adult; 1 L/day - child
EF	Exposure Frequency	365 days/year
ED	Exposure Duration	30 yrs - adult; 6 yrs - child
BW	Body Weight	70 kg - adult; 15 kg - child
AT	Averaging Time	10,950 day - adult (NC); 2,190 day - child (NC) 25,550 day - adult and child (C)

NC - noncarcinogenic averaging time; C - carcinogenic averaging time

Calculation: Dose (mg/kg-day) = CW x IR x EF x ED x 1/BW x 1/AT

TABLE 4-5

DERMAL CONTACT WITH CHEMICALS IN GROUNDWATER

EXPOSURE FACTORS		
Symbol	Factor	Value
CW	Chemical Concentration in Water	Calculated (mg/l) using Leachate Model (See 4.9)
SA	Skin Surface Area	18,150 cm^2 - adult; 7,195 cm^2 - child
PC	Dermal Permeability Constant	Chemical Specific[1]
ET	Exposure Time	0.008 hours/day
EF	Exposure Frequency	365 days/year
ED	Exposure Duration	30 yrs - adult; 6 yrs - child
CF	Conversion Factor	0.001 L/cm^3
BW	Body Weight	70 kg - adult; 15 kg - child
AT	Averaging Time	10,950 day - adult (NC); 2,190 day - child (NC) 25,550 day - adult and child (C)

NC - noncarcinogenic averaging time; C - carcinogenic averaging time

1 In the absence of chemical-specific dermal permeability constants from the open literature, Ohio EPA requires default values of 0.1 cm/hr for insoluble organic compounds and 1.5E-3 cm/hr for water-soluble inorganics or metals, (OEPA, 1991).

Calculation: Dose (mg/kg-day) = CW x SA x PC x ET x EF x ED x CF x 1/BW x 1/AT

TABLE 4-6

INHALATION OF AIRBORNE
CHEMICALS DURING SHOWERING

EXPOSURE FACTORS		
Symbol	Factor	Value
CA	Chemical Concentration in Air	Calculated (mg/m^3) using Shower Model (see 4.10)
IR	Inhalation Rate	0.6 m^3/hr
ET	Exposure Time	0.2 hrs/day
EF	Exposure Frequency	365 days/yr
ED	Exposure Duration	30 yrs - adult; 6 yrs - child
BW	Body Weight	70 kg - adult; 15 kg - child
AT	Averaging Time	10,950 day - adult (NC); 2,190 day - child (NC) 25,550 day - adult and child (C)

NC - noncarcinogenic averaging time; C - carcinogenic averaging time

Calculation: Dose (mg/kg-day) = CA x IR x ET x EF x ED x 1/BW x 1/AT

TABLE 4-7

INHALATION OF VOLATILE CHEMICALS FROM SOIL

EXPOSURE FACTORS		
Symbol	Factor	Value
CA	Chemical Concentration in Air	Calculated using Volatilization Model (see 4.14)
IR	Inhalation Rate	0.833 m^3/hr
ET	Exposure Time	24 hrs/day
EF	Exposure Frequency	365 days/yr
ED	Exposure Duration	30 yrs - adult; 6 yrs - child
BW	Body Weight	70 kg adult; 15 kg child
AT	Averaging Time	10,950 day - adult (NC); 2,190 day - child (NC) 25,550 day - adult and child (C)

NC - noncarcinogenic averaging time; C - carcinogenic averaging time

Calculation: Dose (mg/kg-day) = CA x IR x ET x EF x ED x 1/BW x 1/AT

TABLE 4-8

DERMAL PERMEABILITY CONSTANTS

Chemical	Dermal Permeability Constant (Kp) (cm/hr)
Xylene	3.16 E-04
Ethylbenzene	4.47 E-01
MIBK	1.00 E-01[1]
Toluene	1.70 E-01
Methanol	5.37 E-05
Methylene Chloride	5.62 E-03

All values are based on Flynn (1990).

[1] Based on a default value of 0.1 cm/hr for insoluble organic compounds (OEPA, 1991).

TABLE 4-9

FACTORS USED IN THE BOX MODEL CALCULATION OF AIRBORNE PARTICULATE CONCENTRATIONS

Symbol	Factor	Value	Comments
GR	Particle Generation Rate	373 mg/m^2 hr	1.2 tons/mo/acre (U.S. EPA, 1985)
L	Length of Area	Incinerator Area = 30.5m South Pad = 85.3m West Pad = 36.6m	Refer to Figure 2-1
WS	Wind Speed	9000 m/hr	Conversion of 2.5 m/sec
H	Height of Box	2m	Approximate height of a person

Particulate Concentration in Air = GR x L x 1/WS x 1/H

Chemical Concentration in Air (mg/m^3) = Particulate Concentration (mg/m^3) x Chemical Concentration in Soil (mg/kg) x 10^{-6} kg/mg.

Example: Incinerator Area, Xylene

Particulate Concentration in Air = 373 mg/m^{2}hr x 30.5 m x 1/9000 m/hr x 1/2 m = 0.632 mg/m^3

Chemical Concentration in Air = 0.632 mg/m^3 x 4.0 mg/kg x 10^{-6} kg/mg = 2.52 x 10^{-6} mg/m^3

TABLE 4-10

CONCENTRATION OF CHEMICALS IN AIRBORNE PARTICULATES

Chemical	Concentration of Chemical in Soil (mg/kg)	Concentration of Chemical in Airborne Particulates (mg/m^3)
Incinerator Area		
Xylene	4.00	2.52×10^{-6}
Ethylbenzene	2.00	1.27×10^{-6}
Methylene Chloride	4.00	2.52×10^{-6}
South Pad		
Xylene	8.00	1.41×10^{-5}
Ethylbenzene	2.00	3.54×10^{-6}
MIBK	0.006	1.06×10^{-8}
Toluene	21.00	3.71×10^{-5}
Methylene Chloride	3.00	5.30×10^{-6}
West Pad		
Xylene	2.20	1.39×10^{-6}
Ethylbenzene	0.229	1.45×10^{-7}
Methanol	0.968	6.12×10^{-7}
Toluene	1.34	8.47×10^{-7}

Airborne particulate chemical concentrations calculated from the Box Model and soil concentrations; refer to Table 4-9.

TABLE 4-11

MAXIMUM CONCENTRATION OF CHEMICALS PREDICTED IN GROUNDWATER

Chemical	Maximum Concentration Soil (mg/kg)	K_{oc}	Predicted Maximum Concentrated in Groundwater (mg/l)	Maximum Concentration Limit (MCL) (mg/l)
INCINERATOR AREA				
Xylene	4.0	1,585	1.6×10^{-4}	10.0
Ethylbenzene	2.0	257	5.1×10^{-4}	0.7
Methylene Chloride	4.0	871	3.0×10^{-4}	--
WEST PAD				
Xylene	2.2	1,585	6.1×10^{-5}	10.0
Ethylbenzene	0.229	257	4.0×10^{-5}	0.7
Methanol	0.968	126	3.4×10^{-4}	--
Toluene	1.34	151	3.9×10^{-4}	1.0
SOUTH PAD				
Xylene	8.0	1,585	3.1×10^{-4}	10.0
Ethylbenzene	2.0	257	4.8×10^{-4}	0.7
MIBK	0.006	372	8.4×10^{-7}	--
Toluene	21.0	151	8.7×10^{-3}	1.0
Methylene Chloride	3.0	871	2.1×10^{-4}	--

K_{oc} values obtained from Montgomery and Welkom (1990).

TABLE 4-12

FACTORS USED IN THE CALCULATION OF VOLATILES IN AIR DURING SHOWERING

Symbol	Factor	Value	Comments
CA	Concentration in Air	Calculated (mg/m^3)	See calculation below
CW	Concentration in Water	Calculated (ppm)	See Table 4-11
WV	Volume of water used during shower	50L	(Byard, 1989)
SV	Shower stall volume	$2.5m^3$	(Byard, 1989)
HF	Half-life for volatilization	0.5	Assume volatilization half-life corresponds to length of shower (in minutes).
LF	Linear factor for calculating average concentration	0.5	Assumes initial concentration is O mg/m^3 and increases linearly with time. (0 + final air conc.)/2 = average

Calculation: CA = CW x WV x 1/SV x HF x LF

TABLE 4-13

CONCENTRATION OF VOLATILE CHEMICAL EMISSIONS DURING SHOWERING

Area and Chemical	Concentration in Groundwater (mg/l)	Vapor Concentration (mg/m^3)
INCINERATOR AREA		
Xylene	1.6×10^{-4}	8.0×10^{-4}
Ethylbenzene	5.1×10^{-4}	2.6×10^{-3}
Methylene Chloride	3.0×10^{-4}	1.5×10^{-3}
SOUTH PAD		
Xylene	3.1×10^{-4}	1.6×10^{-3}
Ethylbenzene	4.8×10^{-4}	2.4×10^{-3}
MIBK	8.4×10^{-7}	4.2×10^{-6}
Toluene	8.7×10^{-3}	4.4×10^{-2}
Methylene Chloride	2.1×10^{-4}	1.1×10^{-3}
WEST PAD		
Xylene	6.1×10^{-5}	3.1×10^{-4}
Ethylbenzene	3.9×10^{-5}	2.0×10^{-4}
Methanol	3.4×10^{-4}	1.7×10^{-3}
Toluene	3.9×10^{-4}	2.0×10^{-3}

TABLE 4-14

SOIL-TO-AIR VOLATILIZATION MODEL CALCULATION

Symbol	Factor (Units)	Value
VF	volatilization factor (m^3/kg)	Chemical and Site Specific
LS	length of side of contaminated area (m)	Incinerator Area = 30.5m; South Pad = 85.3m; West Pad = 36.6m;
V	wind speed in mixing zone (m/sec)	2.5 m/sec
DH	diffusion height (m)	2 m
A	area of contamination (cm^2)	Incinerator Area = 11,152,416 cm^2; South Pad = 31,226,766 cm^2; West Pad = 2,788,104 cm^2;
D_{ei}	effective diffusivity (cm^2/sec)	$D_i \times E^{0.33}$
E	true soil porosity (unitless)	0.35
K_{as}	soil/air partition coefficient (g soil/cm^3 air)	$(H/K_d) \times 41$, where 41 is a units conversion factor
P_s	true soil density or particulate density (g/cm^3)	2.65 g/cm^3
T	exposure interval (sec)	7.9×10^8 sec
D_i	molecular diffusivity (cm^2/sec)	chemical-specific
H	Henry's law constant (atm-m^3/mol)	chemical-specific
K_d	soil-water partition coefficient (cm^3/g)	chemical-specific
K_{oc}	organic carbon partition coefficient (cm^3/g)	chemical-specific
OC	organic carbon content of soil (fraction)	0.031 - Lyman, 1983

Values for E and P_s are from EPA 1988a, and EPA 1988b.

Calculation:

$$VF\ (m^3/kg) = \frac{(LS \times V \times DH)}{A} \times \frac{(3.14 \times \alpha \times T)^{1/2}}{(2 \times D_{ei} \times E \times K_{as} \times 10^{-3}\ kg/g)}$$

where:

$$\alpha\ (cm^2/s) = \frac{(D_{ei} \times E)}{E + (P_s)(1-E)/K_{as}}$$

TABLE 4-15

CHEMICAL-SPECIFIC VALUES INCORPORATED INTO THE SOIL-TO-AIR VOLATILIZATION MODEL

Chemical	D_i	H	K_d	K_{oc}	D_{ei}	K_{as}	α
Toluene	4.2E-05	0.0067	4.681	151	3.0E-05	0.059	3.6E-07
Ethylbenzene	1.5E-06	0.0066	7.967	257	1.0E-06	0.034	7.0E-09
Xylene	5.5E-05	0.0053	49.135	1585	3.8E-05	0.004	3.1E-08
Methanol	1.3E-05	0.0076	3.906	126	8.9E-06	0.080	1.4E-07
MIBK	2.5E-06	0.0043	11.532	372	1.7E-06	0.015	5.3E-09
Methylene Chloride	1.1E-06	0.0020	27.001	871	7.9E-07	0.003	4.8E-10

Factors obtained from Lyman et.al., (1982) Handbook of Chemical Properties; CRC (1990) Handbook of Chemistry and Physics; Perry (1990) Chemical Engineers Handbook; Montgomery and Welkom (1990) Groundwater Chemicals Desk Reference.

TABLE 4-16

CONCENTRATION OF VOLATILE CHEMICAL EMISSIONS FROM SOIL

AREA & CHEMICAL	CONCENTRATION IN SOIL (mg/kg)	VAPOR CONCENTRATION (mg/m^3)
Incinerator Area		
Xylene	4.0	3.0×10^{-6}
Ethylbenzene	2.0	7.1×10^{-7}
Methylene Chloride	4.0	3.7×10^{-7}
South Pad		
Xylene	8.0	7.2×10^{-6}
Ethylbenzene	2.0	8.5×10^{-7}
MIBK	0.006	1.8×10^{-9}
Toluene	21.0	6.4×10^{-5}
Methylene Chloride	3.0	3.3×10^{-7}
West Pad		
Xylene	2.2	4.9×10^{-7}
Ethylbenzene	0.229	2.4×10^{-8}
Methanol	0.968	4.7×10^{-7}
Toluene	1.34	1.0×10^{-6}

5.0 RISK CHARACTERIZATION

Risk characterization is the description of the nature and the magnitude of the potential for occurrence of adverse health effects under a specific set of conditions. In this section the criteria identified in the dose-response assessment (Section 3) are compared with the uptake (dose) values presented in the exposure assessment (Section 4).

The toxicity and exposure assessments are summarized and integrated into quantitative expressions of risk. To characterize potential noncarcinogenic effects, comparisons are made between projected intakes of substances and toxicity values. To characterize potential carcinogenic effects, the theoretical probability that an individual will develop cancer over a lifetime of exposure is estimated from conservative projected intakes and chemical-specific dose-response information. The purpose of risk characterization is to present the data that provide a conclusion with regard to the nature and extent of the risk. This section presents a discussion of the risks calculated for each of the three units.

5.1 APPROACH

For each exposure pathway, theoretical excess lifetime cancer risks were calculated for chemicals of concern which are considered carcinogens by the U.S. EPA (methylene chloride). Hazard values were calculated for all of the chemicals which could potentially pose noncarcinogenic hazards: xylene, ethylbenzene, MIBK, toluene, methanol, and methylene chloride. The noncancer hazard value is based on the assumption that there is a level of exposure below which it is unlikely for even sensitive populations to experience adverse health effects. The individual theoretical excess cancer risk assumes a lifetime of exposure to putative carcinogens.

According to OEPA guidance (1991), carcinogens detected at the site must not exceed the upperbound cancer probability of 1×10^{-6} (one chance in one million for a theoretical extra case of cancer). For summed noncarcinogens detected at the site, the total exposure hazard index is required to be below unity. As required by OEPA, calculated risks were added between hazardous constituents and summed across all routes of exposure for each unit.

5.2 RISK CHARACTERIZATION FOR RECEPTORS AND AREAS OF CONCERN

The results of the risk characterization for each unit are presented below.

The health effects calculation tables are organized in the following manner:

- Tables are in numerical order corresponding to area of concern and receptor as follows: Former Liquid Waste Incineration Area, South Pad and West Pad, residential adult, residential child.

- Tables are also in numerical order corresponding to specific pathway as follows: ingestion of groundwater, dermal contact with groundwater, ingestion of soil, dermal contact with soil, inhalation of particulates, inhalation of volatiles from showering, inhalation of volatiles from soil, and combined hazard index and lifetime cancer risks.

5.3 SUMMARY OF POTENTIAL FOR ADVERSE EFFECTS

Table 5-1 presents the summed hazard indices and theoretical excess cancer risks associated with each of the receptors for each unit. Tables 5-2 through 5-7 present the noncancer hazard indices and theoretical excess lifetime cancer risks associated with each exposure pathway and each chemical by unit.

Incinerator Area

Tables 5-8 through 5-15 present the likelihood of adverse effects associated with the residential adult for this area and Tables 5-16 through 5-23 present the likelihood of adverse effects associated with a residential child.

The theoretical excess lifetime cancer risks associated with this area are all lower than the upperbound cancer rate of 1×10^{-6} designated by OEPA (1991) for RCRA closure. For both receptors, the combined hazard index values are lower than the acceptable benchmark of one designated by the U.S. EPA (1989b) and OEPA (1991).

The results for the incinerator area indicate that the summed theoretical excess lifetime cancer risks are 8.83×10^{-7} for the adult and 3.69×10^{-7} for the child. *The combined hazard index values are 6.26×10^{-3} and 1.32×10^{-2} for the adult and child, respectively.*

South Pad

Tables 5-24 through 5-31 present the likelihood of adverse effects associated with residential adult for this area and Tables 5-32 through 5-39 present the likelihood of adverse effects associated with a residential child.

The theoretical excess lifetime cancer risks associated with this area are all lower than the upperbound cancer rate of 1×10^{-6} designated by OEPA (1991) for RCRA closure. For both receptors, the summed hazard index values are lower than the acceptable benchmark of 1 designated by the U.S. EPA (1989b) and OEPA (1991).

The results for the South Pad area indicate that the summed theoretical excess lifetime cancer risks are 6.62×10^{-7} for adult and 2.77×10^{-7} for the child. The combined hazard index values are 1.43×10^{-2} for the adult and 3.22×10^{-2} for the child.

West Pad

Tables 5-40 through 5-47 present the likelihood of adverse effects associated with the residential adult and Tables 5-48 through 5-55 present the likelihood of adverse effects associated with a residential child.

Theoretical excess lifetime cancer risks were not calculated for this area, since the chemicals of concern were not putative carcinogens. For both receptors the combined hazard index values are lower than the acceptable benchmark of 1 designated by the U.S. EPA (1989b) and OEPA (1991). The results for the West Pad area indicate that the combined hazard index values are 8.52×10^{-4} for the adult and 1.91×10^{-3} for the child.

TABLE 5-1

SUMMARY OF COMBINED HAZARD INDICES
AND THEORETICAL EXCESS LIFETIME CANCER RISKS

Receptor/Area	Combined Hazard Index	Theoretical Excess Lifetime Cancer Risks
Adult/Incinerator Area	*6.26 E-03*	8.83 E-07
Child/Incinerator Area	*1.32 E-02*	3.69 E-07
Adult/South Pad	1.43 E-02	6.62 E-07
Child/South Pad	3.22 E-02	2.77 E-07
Adult/West Pad	8.52 E-04	NA
Child/West Pad	1.91 E-03	NA

NA - No putitive carcinogenic chemicals detected in this area

TABLE 5-2

NONCANCER HAZARD VALUES AND THEORETICAL EXCESS LIFETIME CANCER RISKS BY CHEMICAL FOR THE INCINERATOR AREA

Chemical	Hypothetical Residential Receptor	Noncancer Hazard Index	Theoretical Excess Lifetime Cancer Risks
Xylene	Adult	1.36E-04	0.00E+00
	Child	*2.86E-04*	0.00E+00
Ethylbenzene	Adult	1.50E-03	0.00E+00
	Child	*3.18E-03*	0.00E+00
Methylene Chloride	Adult	4.63E-03	8.83E-07
	Child	*9.78E-03*	3.69E-07

TABLE 5-3

NONCANCER HAZARD VALUES AND THEORETICAL EXCESS LIFETIME CANCER RISKS BY EXPOSURE PATHWAY FOR THE INCINERATOR AREA

Exposure Pathway	Hypothetical Residential Receptor	Noncancer Hazard Index	Theoretical Excess Lifetime Cancer Risks
Ingestion of Chemicals in Groundwater	Adult	2.91E-04	2.76E-08
	Child	6.79E-04	1.29E-08
Dermal Contact with Chemicals in Groundwater	Adult	4.79E-06	1.12E-11
	Child	8.86E-06	4.16E-12
Ingestion of Chemicals in Soil	Adult	1.27E-04	1.84E-08
	Child	1.18E-03	3.43E-08
Dermal Contact with Chemicals in Soil	Adult	5.76E-03	8.35E-07
	Child	1.10E-02	8.00E-07
Inhalation of Chemicals on Airborne Particulates	Adult	1.63E-05	5.92E-10
	Child	7.61E-05	5.53E-10
Inhalation of Chemicals from Vapor While Showering	Adult	5.89E-05	1.76E-09
	Child	2.75E-04	1.65E-09
Inhalation of Chemicals from Vapors from Soil	Adult	2.89E-06	7.25E-11
	Child	1.34E-05	6.76E-11

TABLE 5-4

NONCANCER HAZARD VALUES AND THEORETICAL EXCESS LIFETIME CANCER RISKS BY CHEMICAL FOR THE SOUTH PAD

Chemical	Hypothetical Residential Receptor	Noncancer Hazard Index	Theorectical Excess Lifetime Cancer Risks
Xylene	Adult	2.73E-04	0.00E+00
	Child	5.77E-04	0.00E+00
Ethylbenzene	Adult	1.49E-03	0.00E+00
	Child	3.16E-03	0.00E+00
MIBK	Adult	8.96E-06	0.00E+00
	Child	2.00E-05	0.00E+00
Toluene	Adult	9.01E-03	0.00E+00
	Child	2.10E-02	0.00E+00
Methylene Chloride	Adult	3.48E-03	6.62E-07
	Child	7.38E-03	2.77E-07

TABLE 5-5

NONCANCER HAZARD VALUES AND THEORETICAL EXCESS LIFETIME CANCER RISKS BY EXPOSURE PATHWAY FOR THE SOUTH PAD

Exposure Pathway	Hypothetical Residential Receptor	Noncancer Hazard Index	Theoretical Excess Lifetime Cancer Risks
Ingestion of Chemicals in Groundwater	Adult	1.48E-03	1.93E-08
	Child	3.46E-03	9.00E-09
Dermal Contact with Chemicals in Groundwater	Adult	1.98E-05	7.87E-12
	Child	3.67E-05	2.91E-12
Ingestion of Chemicals in Soil	Adult	2.56E-04	1.38E-08
	Child	2.39E-03	2.57E-08
Dermal Contact with Chemicals in Soil	Adult	1.16E-02	6.26E-07
	Child	2.23E-02	2.40E-07
Inhalation of Chemicals on Airborne Particulates	Adult	1.27E-04	1.03E-09
	Child	5.92E-04	9.66E-10
Inhalation of Chemicals from Vapors While Showering	Adult	7.33E-04	1.29E-09
	Child	3.42E-03	1.21E-09
Inhalation of Chemicals from Vapors from Soil	Adult	1.69E-04	6.52E-11
	Child	7.87E-04	6.09E-11

TABLE 5-6

NONCANCER HAZARD VALUES AND THEORETICAL EXCESS LIFETIME CANCER RISKS BY CHEMICAL FOR THE WEST PAD

Chemical	Hypothetical Residential Receptor	Noncancer Hazard Index	Theorectical Excess Lifetime Cancer Risks
Xylene	Adult	7.44E-05	0.00E+00
	Child	1.56E-04	0.00E+00
Ethylbenzene	Adult	1.65E-04	0.00E+00
	Child	3.48E-04	0.00E+00
Methanol	Adult	7.87E-05	0.00E+00
	Child	1.96E-04	0.00E+00
Toluene	Adult	5.35E-04	0.00E+00
	Child	1.21E-03	0.00E+00

TABLE 5-7

NONCANCER HAZARD VALUES AND THEORETICAL EXCESS LIFETIME CANCER RISKS BY EXPOSURE PATHWAY FOR THE WEST PAD

Exposure Pathway	Hypothetical Residential Receptor	Noncancer Hazard Index	Theorectical Excess Lifetime Cancer Risks
Ingestion of Chemicals in Groundwater	Adult	8.72E-05	0.00E+00
	Child	2.03E-04	0.00E+00
Dermal Contact with Chemicals in Groundwater	Adult	1.05E-06	0.00E+00
	Child	1.94E-06	0.00E+00
Ingestion of Chemicals in Soil	Adult	1.72E-05	0.00E+00
	Child	1.60E-04	0.00E+00
Dermal Contact with Chemicals in Soil	Adult	7.06E-04	0.00E+00
	Child	1.35E-03	0.00E+00
Inhalation of Chemicals on Airborne Particulates	Adult	2.88E-06	0.00E+00
	Child	1.34E-05	0.00E+00
Inhalation of Chemicals from Vapors While Showering	Adult	3.84E-05	0.00E+00
	Child	1.79E-04	0.00E+00
Inhalation of Chemicals from Vapors from Soil	Adult	3.01E-06	0.00E+00
	Child	1.40E-05	0.00E+00

Residential Adult
Incinerator Area

Table 5-8

Ingestion of Chemicals in Groundwater

Compound	CAS No.	Groundwater Concentration (mg/l)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	1.60E-04	4.57E-06	2.00E+00	2.29E-06	1.96E-06	NA	--
Ethylbenzene	100-41-4	5.10E-04	1.46E-05	1.00E-01	1.46E-04	6.24E-06	NA	--
Methylene Chloride	75-09-2	3.00E-04	8.57E-06	6.00E-02	1.43E-04	3.67E-06	7.50E-03	2.76E-08
Summed:					2.91E-04			2.76E-08

Residential Adult
Incinerator Area

Table 5-9

Dermal Contact with Chemicals in Groundwater

Compound	CAS No.	Groundwater Concentration (mg/l)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	1.60E-04	1.05E-10	2.00E+00	5.24E-11	4.49E-11	NA	--
Ethylbenzene	100-41-4	5.10E-04	4.73E-07	1.00E-01	4.73E-06	2.03E-07	NA	--
Methylene Chloride	75-09-2	3.00E-04	3.50E-09	6.00E-02	5.83E-08	1.50E-09	7.50E-03	1.12E-11
Summed:					4.79E-06			1.12E-11

Residential Adult
Incinerator Area

Table 5-10

Ingestion of Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	4.00E+00	5.71E-06	2.00E+00	2.86E-06	2.45E-06	NA	--
Ethylbenzene	100-41-4	2.00E+00	2.86E-06	1.00E-01	2.86E-05	1.22E-06	NA	--
Methylene Chloride	75-09-2	4.00E+00	5.71E-06	6.00E-02	9.52E-05	2.45E-06	7.50E-03	1.84E-08
Summed:					1.27E-04			1.84E-08

Residential Adult
Incinerator Area

Table 5-11

Dermal Contact with Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	4.00E+00	2.60E-04	2.00E+00	1.30E-04	1.11E-04	NA	--
Ethylbenzene	100-41-4	2.00E+00	1.30E-04	1.00E-01	1.30E-03	5.57E-05	NA	--
Methylene Chloride	75-09-2	4.00E+00	2.60E-04	6.00E-02	4.33E-03	1.11E-04	7.50E-03	8.35E-07
Summed:					5.76E-03			8.35E-07

Residential Adult
Incinerator Area

Table 5-12

Inhalation of Chemicals From Particulates

Compound	CAS No.	Soil Concentration (mg/kg)	Concentration in Suspended Particulates (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	4.00E+00	3.03E-06	8.63E-07	2.00E+00	4.32E-07	3.70E-07	NA	--
Ethylbenzene	100-41-4	2.00E+00	1.52E-06	4.32E-07	2.90E-01	1.49E-06	1.85E-07	NA	--
Methylene Chloride	75-09-2	4.00E+00	3.03E-06	8.63E-07	6.00E-02	1.44E-05	3.70E-07	1.60E-03	5.92E-10
Summed:						1.63E-05			5.92E-10

Residential Adult
Incinerator Area

Table 5-13

Inhalation of Chemicals From Vapors While Showering

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	8.00E-04	1.37E-06	2.00E+00	6.86E-07	5.88E-07	NA	--
Ethylbenzene	100-41-4	2.60E-03	4.46E-06	2.90E-01	1.54E-05	1.91E-06	NA	--
Methylene Chloride	75-09-2	1.50E-03	2.57E-06	6.00E-02	4.29E-05	1.10E-06	1.60E-03	1.76E-09
Summed:					5.89E-05			1.76E-09

Residential Adult
Incinerator Area

Table 5-14

Inhalation of Chemicals From Vapors From Soil

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	3.00E-06	8.57E-07	2.00E+00	4.28E-07	3.67E-07	NA	--
Ethylbenzene	100-41-4	7.10E-07	2.03E-07	2.90E-01	6.99E-07	8.69E-08	NA	--
Methylene Chloride	75-09-2	3.70E-07	1.06E-07	6.00E-02	1.76E-06	4.53E-08	1.60E-03	7.25E-11
Summed:					2.89E-06			7.25E-11

Residential Adult
Incinerator Area

Table 5-15

Combined Hazard Index and Lifetime Cancer Risks

Compound	CAS No.	Combined Hazard Index	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	1.36E-04	0.00E+00
Ethylbenzene	100-41-4	1.50E-03	0.00E+00
Methylene Chloride	75-09-2	4.63E-03	8.83E-07
Summed:		6.26E-03	8.83E-07

Residential Child
Incinerator Area

Table 5-16

Ingestion of Chemicals in Groundwater

Compound	CAS No.	Groundwater Concentration (mg/l)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	1.60E-04	1.07E-05	2.00E+00	5.33E-06	9.14E-07	NA	--
Ethylbenzene	100-41-4	5.10E-04	3.40E-05	1.00E-01	3.40E-04	2.91E-06	NA	--
Methylene Chloride	75-09-2	3.00E-04	2.00E-05	6.00E-02	3.33E-04	1.71E-06	7.50E-03	1.29E-08
Summed:					6.79E-04			1.29E-08

Residential Child
Incinerator Area

Table 5-17

Dermal Contact with Chemicals in Groundwater

Compound	CAS No.	Groundwater Concentration (mg/l)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	1.60E-04	1.94E-10	2.00E+00	9.70E-11	1.66E-11	NA	--
Ethylbenzene	100-41-4	5.10E-04	8.75E-07	1.00E-01	8.75E-06	7.50E-08	NA	--
Methylene Chloride	75-09-2	3.00E-04	6.47E-09	6.00E-02	1.08E-07	5.55E-10	7.50E-03	4.16E-12
Summed:					8.86E-06			4.16E-12

Residential Child
Incinerator Area

Table 5-18

Ingestion of Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	4.00E+00	5.33E-05	2.00E+00	2.67E-05	4.57E-06	NA	--
Ethylbenzene	100-41-4	2.00E+00	2.67E-05	1.00E-01	2.67E-04	2.29E-06	NA	--
Methylene Chloride	75-09-2	4.00E+00	5.33E-05	6.00E-02	8.89E-04	4.57E-06	7.50E-03	3.43E-08
Summed:					1.18E-03			3.43E-08

Residential Child
Incinerator Area

Table 5-19

Dermal Contact with Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	4.00E+00	4.97E-04	2.00E+00	2.49E-04	4.26E-05	NA	--
Ethylbenzene	100-41-4	2.00E+00	2.49E-04	1.00E-01	2.49E-03	2.13E-05	NA	--
Methylene Chloride	75-09-2	4.00E+00	4.97E-04	6.00E-02	8.29E-03	4.26E-05	7.50E-03	3.20E-07
Summed:					1.10E-02			3.20E-07

Residential Child
Incinerator Area

Table 5-20

Inhalation of Chemicals From Particulates

Compound	CAS No.	Soil Concentration (mg/kg)	Concentration in Suspended Particulates (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	4.00E+00	3.03E-06	4.03E-06	2.00E+00	2.01E-06	3.45E-07	NA	--
Ethylbenzene	100-41-4	2.00E+00	1.52E-06	2.01E-06	2.90E-01	6.95E-06	1.73E-07	NA	--
Methylene Chloride	75-09-2	4.00E+00	3.03E-06	4.03E-06	6.00E-02	6.71E-05	3.45E-07	1.60E-03	5.53E-10
Summed:						7.61E-05			5.53E-10

Residential Child
Incinerator Area

Table 5-21

Inhalation of Chemicals From Vapors While Showering

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	8.00E-04	6.40E-06	2.00E+00	3.20E-06	5.49E-07	NA	--
Ethylbenzene	100-41-4	2.60E-03	2.08E-05	2.90E-01	7.17E-05	1.78E-06	NA	--
Methylene Chloride	75-09-2	1.50E-03	1.20E-05	6.00E-02	2.00E-04	1.03E-06	1.60E-03	1.65E-09
Summed:					2.75E-04			1.65E-09

Residential Child
Incinerator Area

Table 5-22

Inhalation of Chemicals From Vapors From Soil

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	3.00E-06	3.98E-06	2.00E+00	1.99E-06	3.41E-07	NA	--
Ethylbenzene	100-41-4	7.10E-07	9.43E-07	2.90E-01	3.25E-06	8.08E-08	NA	--
Methylene Chloride	75-09-2	3.70E-07	4.91E-07	6.00E-02	8.19E-06	4.21E-08	1.60E-03	6.74E-11
Summed:					1.34E-05			6.74E-11

Residential Child
Incinerator Area

Table 5-23

Combined Hazard Index and Lifetime Cancer Risks

Compound	CAS No.	Combined Hazard Index	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	2.86E-04	0.00E+00
Ethylbenzene	100-41-4	3.18E-03	0.00E+00
Methylene Chloride	75-09-2	9.78E-03	3.69E-07
Summed:		1.32E-02	3.69E-07

Residential Adult
South Pad

Table 5-24

Ingestion of Chemicals in Groundwater

Compound	CAS No.	Groundwater Concentration (mg/l)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	3.10E-04	8.86E-06	2.00E+00	4.43E-06	3.80E-06	NA	--
Ethylbenzene	100-41-4	4.80E-04	1.37E-05	1.00E-01	1.37E-04	5.88E-06	NA	--
MIBK	95-50-1	8.40E-07	2.40E-08	5.00E-02	4.80E-07	1.03E-08	NA	--
Toluene	108-88-3	8.70E-03	2.49E-04	2.00E-01	1.24E-03	1.07E-04	NA	--
Methylene Chloride	75-09-2	2.10E-04	6.00E-06	6.00E-02	1.00E-04	2.57E-06	7.50E-03	1.93E-08
Summed:					1.48E-03			1.93E-08

Residential Adult
South Pad

Table 5-25

Dermal Contact with Chemicals in Groundwater

Compound	CAS No.	Groundwater Concentration (mg/l)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	3.10E-04	2.03E-10	2.00E+00	1.02E-10	8.71E-11	NA	--
Ethylbenzene	100-41-4	4.80E-04	4.45E-07	1.00E-01	4.45E-06	1.91E-07	NA	--
MIBK	95-50-1	8.40E-07	1.74E-10	5.00E-02	3.48E-09	7.47E-11	NA	--
Toluene	108-88-3	8.70E-03	3.07E-06	2.00E-01	1.53E-05	1.31E-06	NA	--
Methylene Chloride	75-09-2	2.10E-04	2.45E-09	6.00E-02	4.08E-08	1.05E-09	7.50E-03	7.87E-12
Summed:					1.98E-05			7.87E-12

Residential Adult
South Pad

Table 5-26

Ingestion of Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	8.00E+00	1.14E-05	2.00E+00	5.71E-06	4.90E-06	NA	--
Ethylbenzene	100-41-4	2.00E+00	2.86E-06	1.00E-01	2.86E-05	1.22E-06	NA	--
MIBK	95-50-1	6.00E-03	8.57E-09	5.00E-02	1.71E-07	3.67E-09	NA	--
Toluene	108-88-3	2.10E+01	3.00E-05	2.00E-01	1.50E-04	1.29E-05	NA	--
Methylene Chloride	75-09-2	3.00E+00	4.29E-06	6.00E-02	7.14E-05	1.84E-06	7.50E-03	1.38E-08
Summed:					2.56E-04			1.38E-08

Residential Adult
South Pad

Table 5-27

Dermal Contact with Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	8.00E+00	5.20E-04	2.00E+00	2.60E-04	2.23E-04	NA	--
Ethylbenzene	100-41-4	2.00E+00	1.30E-04	1.00E-01	1.30E-03	5.57E-05	NA	--
MIBK	95-50-1	6.00E-03	3.90E-07	5.00E-02	7.79E-06	1.67E-07	NA	--
Toluene	108-88-3	2.10E+01	1.36E-03	2.00E-01	6.82E-03	5.85E-04	NA	--
Methylene Chloride	75-09-2	3.00E+00	1.95E-04	6.00E-02	3.25E-03	8.35E-05	7.50E-03	6.26E-07
Summed:					1.16E-02			6.26E-07

Residential Adult
South Pad

Table 5-28

Inhalation of Chemicals From Particulates

Compound	CAS No.	Soil Concentration (mg/kg)	Concentration in Suspended Particulates (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	8.00E+00	1.41E-05	4.02E-06	2.00E+00	2.01E-06	1.72E-06	NA	--
Ethylbenzene	100-41-4	2.00E+00	3.54E-06	1.01E-06	2.90E-01	3.47E-06	4.31E-07	NA	--
MIBK	95-50-1	6.00E-03	1.06E-08	3.02E-09	2.00E-02	1.51E-07	1.29E-09	NA	--
Toluene	108-88-3	2.10E+01	3.71E-05	1.06E-05	1.10E-01	9.60E-05	4.53E-06	NA	--
Methylene Chloride	75-09-2	3.00E+00	5.30E-06	1.51E-06	6.00E-02	2.52E-05	6.47E-07	1.60E-03	1.03E-09
Summed:						1.27E-04			1.03E-09

Residential Adult
South Pad

Table 5-29

Inhalation of Chemicals From Vapors While Showering

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	1.60E-03	2.74E-06	2.00E+00	1.37E-06	1.18E-06	NA	--
Ethylbenzene	100-41-4	2.40E-03	4.11E-06	2.90E-01	1.42E-05	1.76E-06	NA	--
MIBK	95-50-1	4.20E-06	7.20E-09	2.00E-02	3.60E-07	3.09E-09	NA	--
Toluene	108-88-3	4.40E-02	7.54E-05	1.10E-01	6.86E-04	3.23E-05	NA	--
Methylene Chloride	75-09-2	1.10E-03	1.89E-06	6.00E-02	3.14E-05	8.08E-07	1.60E-03	1.29E-09
Summed:					7.33E-04			1.29E-09

Residential Adult
South Pad

Table 5-30

Inhalation of Chemicals From Vapors From Soil

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	7.14E-06	2.04E-06	2.00E+00	1.02E-06	8.74E-07	NA	--
Ethylbenzene	100-41-4	8.48E-07	2.42E-07	2.90E-01	8.35E-07	1.04E-07	NA	--
MIBK	95-50-1	1.83E-09	5.23E-10	2.00E-02	2.61E-08	2.24E-10	NA	--
Toluene	108-88-3	6.36E-05	1.82E-05	1.10E-01	1.65E-04	7.78E-06	NA	--
Methylene Chloride	75-09-2	3.33E-07	9.51E-08	6.00E-02	1.59E-06	4.08E-08	1.60E-03	6.52E-11
Summed:					1.69E-04			6.52E-11

Residential Adult
South Pad

Table 5-31

Combined Hazard Index and Lifetime Cancer Risks

Compound	CAS No.	Combined Hazard Index	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	2.73E-04	0.00E+00
Ethylbenzene	100-41-4	1.49E-03	0.00E+00
MIBK	95-50-1	8.96E-06	0.00E+00
Toluene	108-88-3	9.01E-03	0.00E+00
Methylene Chloride	75-09-2	3.48E-03	6.62E-07
Summed:		1.43E-02	6.62E-07

Residential Child
South Pad

Table 5-32

Ingestion of Chemicals in Groundwater

Compound	CAS No.	Groundwater Concentration (mg/l)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	3.10E-04	2.07E-05	2.00E+00	1.03E-05	1.77E-06	NA	--
Ethylbenzene	100-41-4	4.80E-04	3.20E-05	1.00E-01	3.20E-04	2.74E-06	NA	--
MIBK	95-50-1	8.40E-07	5.60E-08	5.00E-02	1.12E-06	4.80E-09	NA	--
Toluene	108-88-3	8.70E-03	5.80E-04	2.00E-01	2.90E-03	4.97E-05	NA	--
Methylene Chloride	75-09-2	2.10E-04	1.40E-05	6.00E-02	2.33E-04	1.20E-06	7.50E-03	9.00E-09
Summed:					3.46E-03			9.00E-09

Residential Child
South Pad

Table 5-33

Dermal Contact with Chemicals in Groundwater

Compound	CAS No.	Groundwater Concentration (mg/l)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	3.10E-04	3.76E-10	2.00E+00	1.88E-10	3.22E-11	NA	--
Ethylbenzene	100-41-4	4.80E-04	8.23E-07	1.00E-01	8.23E-06	7.06E-08	NA	--
MIBK	95-50-1	8.40E-07	3.22E-10	5.00E-02	6.45E-09	2.76E-11	NA	--
Toluene	108-88-3	8.70E-03	5.68E-06	2.00E-01	2.84E-05	4.86E-07	NA	--
Methylene Chloride	75-09-2	2.10E-04	4.53E-09	6.00E-02	7.55E-08	3.88E-10	7.50E-03	2.91E-12
Summed:					3.67E-05			2.91E-12

Residential Child
South Pad

Table 5-34

Ingestion of Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	8.00E+00	1.07E-04	2.00E+00	5.33E-05	9.14E-06	NA	--
Ethylbenzene	100-41-4	2.00E+00	2.67E-05	1.00E-01	2.67E-04	2.29E-06	NA	--
MIBK	95-50-1	6.00E-03	8.00E-08	5.00E-02	1.60E-06	6.86E-09	NA	--
Toluene	108-88-3	2.10E+01	2.80E-04	2.00E-01	1.40E-03	2.40E-05	NA	--
Methylene Chloride	75-09-2	3.00E+00	4.00E-05	6.00E-02	6.67E-04	3.43E-06	7.50E-03	2.57E-08
Summed:					2.39E-03			2.57E-08

Residential Child
South Pad

Table 5-35

Dermal Contact with Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	8.00E+00	9.95E-04	2.00E+00	4.97E-04	8.52E-05	NA	--
Ethylbenzene	100-41-4	2.00E+00	2.49E-04	1.00E-01	2.49E-03	2.13E-05	NA	--
MIBK	95-50-1	6.00E-03	7.46E-07	5.00E-02	1.49E-05	6.39E-08	NA	--
Toluene	108-88-3	2.10E+01	2.61E-03	2.00E-01	1.31E-02	2.24E-04	NA	--
Methylene Chloride	75-09-2	3.00E+00	3.73E-04	6.00E-02	6.22E-03	3.20E-05	7.50E-03	2.40E-07
Summed:					2.23E-02			2.40E-07

Residential Child
South Pad

Table 5-36

Inhalation of Chemicals From Particulates

Compound	CAS No.	Soil Concentration (mg/kg)	Concentration in Suspended Particulates (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	8.00E+00	1.41E-05	1.88E-05	2.00E+00	9.39E-06	1.61E-06	NA	--
Ethylbenzene	100-41-4	2.00E+00	3.54E-06	4.69E-06	2.90E-01	1.62E-05	4.02E-07	NA	--
MIBK	95-50-1	6.00E-03	1.06E-08	1.41E-08	2.00E-02	7.04E-07	1.21E-09	NA	--
Toluene	108-88-3	2.10E+01	3.71E-05	4.93E-05	1.10E-01	4.48E-04	4.23E-06	NA	--
Methylene Chloride	75-09-2	3.00E+00	5.30E-06	7.04E-06	6.00E-02	1.17E-04	6.04E-07	1.60E-03	9.66E-10
Summed:						5.92E-04			9.66E-10

Residential Child
South Pad

Table 5-37

Inhalation of Chemicals From Vapors While Showering

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	1.60E-03	1.28E-05	2.00E+00	6.40E-06	1.10E-06	NA	--
Ethylbenzene	100-41-4	2.40E-03	1.92E-05	2.90E-01	6.62E-05	1.65E-06	NA	--
MIBK	95-50-1	4.20E-06	3.36E-08	2.00E-02	1.68E-06	2.88E-09	NA	--
Toluene	108-88-3	4.40E-02	3.52E-04	1.10E-01	3.20E-03	3.02E-05	NA	--
Methylene Chloride	75-09-2	1.10E-03	8.80E-06	6.00E-02	1.47E-04	7.54E-07	1.60E-03	1.21E-09
Summed:					3.42E-03			1.21E-09

Residential Child
South Pad

Table 5-38

Inhalation of Chemicals From Vapors From Soil

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	7.14E-06	9.52E-06	2.00E+00	4.76E-06	8.16E-07	NA	--
Ethylbenzene	100-41-4	8.48E-07	1.13E-06	2.90E-01	3.90E-06	9.69E-08	NA	--
MIBK	95-50-1	1.83E-09	2.44E-09	2.00E-02	1.22E-07	2.09E-10	NA	--
Toluene	108-88-3	6.36E-05	8.48E-05	1.10E-01	7.71E-04	7.27E-06	NA	--
Methylene Chloride	75-09-2	3.33E-07	4.44E-07	6.00E-02	7.40E-06	3.80E-08	1.60E-03	6.09E-11
Summed:					7.87E-04			6.09E-11

Residential Child
South Pad

Table 5-39

Combined Hazard Index and Lifetime Cancer Risks

Compound	CAS No.	Combined Hazard Index	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	5.77E-04	0.00E+00
Ethylbenzene	100-41-4	3.16E-03	0.00E+00
MIBK	95-50-1	2.00E-05	0.00E+00
Toluene	108-88-3	2.10E-02	0.00E+00
Methylene Chloride	75-09-2	7.38E-03	2.77E-07
Summed:		3.22E-02	2.77E-07

Residential Adult
West Pad

Table 5-40

Ingestion of Chemicals in Groundwater

Compound	CAS No.	Groundwater Concentration (mg/l)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	6.10E-05	1.74E-06	2.00E+00	8.71E-07	7.47E-07	NA	--
Ethylbenzene	100-41-4	3.90E-05	1.11E-06	1.00E-01	1.11E-05	4.78E-07	NA	--
Methanol	67-56-1	3.40E-04	9.71E-06	5.00E-01	1.94E-05	4.16E-06	NA	--
Toluene	108-88-3	3.90E-04	1.11E-05	2.00E-01	5.57E-05	4.78E-06	NA	--
Summed:					8.72E-05			0.00E+00

Residential Adult
West Pad

Table 5-41

Dermal Contact with Chemicals in Groundwater

Compound	CAS No.	Groundwater Concentration (mg/l)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	6.10E-05	4.00E-11	2.00E+00	2.00E-11	1.71E-11	NA	--
Ethylbenzene	100-41-4	3.90E-05	3.62E-08	1.00E-01	3.62E-07	1.55E-08	NA	--
Methanol	67-56-1	3.40E-04	3.79E-11	5.00E-01	7.57E-11	1.62E-11	NA	--
Toluene	108-88-3	3.90E-04	1.38E-07	2.00E-01	6.88E-07	5.89E-08	NA	--
Summed:					1.05E-06			0.00E+00

Residential Adult
West Pad

Table 5-42

Ingestion of Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	2.20E+00	3.14E-06	2.00E+00	1.57E-06	1.35E-06	NA	--
Ethylbenzene	100-41-4	2.29E-01	3.27E-07	1.00E-01	3.27E-06	1.40E-07	NA	--
Methanol	67-56-1	9.68E-01	1.38E-06	5.00E-01	2.77E-06	5.93E-07	NA	--
Toluene	108-88-3	1.34E+00	1.91E-06	2.00E-01	9.57E-06	8.20E-07	NA	--
Summed:					1.72E-05			0.00E+00

Residential Adult
West Pad

Table 5-43

Dermal Contact with Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	2.20E+00	1.43E-04	2.00E+00	7.15E-05	6.12E-05	NA	--
Ethylbenzene	100-41-4	2.29E-01	1.49E-05	1.00E-01	1.49E-04	6.38E-06	NA	--
Methanol	67-56-1	9.68E-01	2.52E-05	5.00E-01	5.03E-05	1.08E-05	NA	--
Toluene	108-88-3	1.34E+00	8.70E-05	2.00E-01	4.35E-04	3.73E-05	NA	--
Summed:					7.06E-04			0.00E+00

Residential Adult
West Pad

Table 5-44

Inhalation of Chemicals From Particulates

Compound	CAS No.	Soil Concentration (mg/kg)	Concentration in Suspended Particulates (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	2.20E+00	1.39E-06	3.96E-07	2.00E+00	1.98E-07	1.70E-07	NA	--
Ethylbenzene	100-41-4	2.29E-01	1.45E-07	4.12E-08	2.90E-01	1.42E-07	1.77E-08	NA	--
Methanol	67-56-1	9.68E-01	6.12E-07	1.74E-07	5.00E-01	3.48E-07	7.46E-08	NA	--
Toluene	108-88-3	1.34E+00	8.47E-07	2.41E-07	1.10E-01	2.19E-06	1.03E-07	NA	--
Summed:						2.88E-06			0.00E+00

Residential Adult
West Pad

Table 5-45

Inhalation of Chemicals From Vapors While Showering

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	3.10E-04	5.31E-07	2.00E+00	2.66E-07	2.28E-07	NA	--
Ethylbenzene	100-41-4	2.00E-04	3.43E-07	2.90E-01	1.18E-06	1.47E-07	NA	--
Methanol	67-56-1	1.70E-03	2.91E-06	5.00E-01	5.83E-06	1.25E-06	NA	--
Toluene	108-88-3	2.00E-03	3.43E-06	1.10E-01	3.12E-05	1.47E-06	NA	--
Summed:					3.84E-05			0.00E+00

Residential Adult
West Pad

Table 5-46

Inhalation of Chemicals From Vapors From Soil

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	4.90E-07	1.40E-07	2.00E+00	7.00E-08	6.00E-08	NA	--
Ethylbenzene	100-41-4	2.42E-08	6.91E-09	2.90E-01	2.38E-08	2.96E-09	NA	--
Methanol	67-56-1	4.68E-07	1.34E-07	5.00E-01	2.67E-07	5.73E-08	NA	--
Toluene	108-88-3	1.02E-06	2.91E-07	1.10E-01	2.65E-06	1.25E-07	NA	--
Summed:					3.01E-06			0.00E+00

Residential Adult
West Pad

Table 5-47

Combined Hazard Index and Lifetime Cancer Risks

Compound	CAS No.	Combined Hazard Index	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	7.44E-05	0.00E+00
Ethylbenzene	100-41-4	1.65E-04	0.00E+00
Methanol	67-56-1	7.87E-05	0.00E+00
Toluene	108-88-3	5.35E-04	0.00E+00
Summed:		8.52E-04	0.00E+00

Residential Child
West Pad

Table 5-48

Ingestion of Chemicals in Groundwater

Compound	CAS No.	Groundwater Concentration (mg/l)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	6.10E-05	4.07E-06	2.00E+00	2.03E-06	3.49E-07	NA	--
Ethylbenzene	100-41-4	3.90E-05	2.60E-06	1.00E-01	2.60E-05	2.23E-07	NA	--
Methanol	67-56-1	3.40E-04	2.27E-05	5.00E-01	4.53E-05	1.94E-06	NA	--
Toluene	108-88-3	3.90E-04	2.60E-05	2.00E-01	1.30E-04	2.23E-06	NA	--
Summed:					2.03E-04			0.00E+00

Residential Child
West Pad

Table 5-49

Dermal Contact with Chemicals in Groundwater

Compound	CAS No.	Groundwater Concentration (mg/l)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	6.10E-05	7.40E-11	2.00E+00	3.70E-11	6.34E-12	NA	--
Ethylbenzene	100-41-4	3.90E-05	6.69E-08	1.00E-01	6.69E-07	5.73E-09	NA	--
Methanol	67-56-1	3.40E-04	7.01E-11	5.00E-01	1.40E-10	6.01E-12	NA	--
Toluene	108-88-3	3.90E-04	2.54E-07	2.00E-01	1.27E-06	2.18E-08	NA	--
Summed:					1.94E-06			0.00E+00

Residential Child
West Pad

Table 5-50

Ingestion of Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	2.20E+00	2.93E-05	2.00E+00	1.47E-05	2.51E-06	NA	--
Ethylbenzene	100-41-4	2.29E-01	3.05E-06	1.00E-01	3.05E-05	2.62E-07	NA	--
Methanol	67-56-1	9.68E-01	1.29E-05	5.00E-01	2.58E-05	1.11E-06	NA	--
Toluene	108-88-3	1.34E+00	1.79E-05	2.00E-01	8.93E-05	1.53E-06	NA	--
Summed:					1.60E-04			0.00E+00

Residential Child
West Pad

Table 5-51

Dermal Contact with Chemicals in Soil

Compound	CAS No.	Soil Concentration (mg/kg)	Average Daily Dose (mg/kg/day)	Oral Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Oral Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	2.20E+00	2.73E-04	2.00E+00	1.37E-04	2.34E-05	NA	--
Ethylbenzene	100-41-4	2.29E-01	2.85E-05	1.00E-01	2.85E-04	2.44E-06	NA	--
Methanol	67-56-1	9.68E-01	4.81E-05	5.00E-01	9.63E-05	4.13E-06	NA	--
Toluene	108-88-3	1.34E+00	1.67E-04	2.00E-01	8.33E-04	1.43E-05	NA	--
Summed:					1.35E-03			0.00E+00

Residential Child
West Pad

Table 5-52

Inhalation of Chemicals from Particulates

Compound	CAS No.	Soil Concentration (mg/kg)	Concentration in Suspended Particulates (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	2.20E+00	1.39E-06	1.85E-06	2.00E+00	9.23E-07	1.58E-07	NA	--
Ethylbenzene	100-41-4	2.29E-01	1.45E-07	1.92E-07	2.90E-01	6.63E-07	1.65E-08	NA	--
Methanol	67-56-1	9.68E-01	6.12E-07	8.12E-07	5.00E-01	1.62E-06	6.96E-08	NA	--
Toluene	108-88-3	1.34E+00	8.47E-07	1.12E-06	1.10E-01	1.02E-05	9.64E-08	NA	--
Summed:						1.34E-05			0.00E+00

Residential Child
West Pad

Table 5-53

Inhalation of Chemicals From Vapors While Showering

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	3.10E-04	2.48E-06	2.00E+00	1.24E-06	2.13E-07	NA	--
Ethylbenzene	100-41-4	2.00E-04	1.60E-06	2.90E-01	5.52E-06	1.37E-07	NA	--
Methanol	67-56-1	1.70E-03	1.36E-05	5.00E-01	2.72E-05	1.17E-06	NA	--
Toluene	108-88-3	2.00E-03	1.60E-05	1.10E-01	1.45E-04	1.37E-06	NA	--
Summed:					1.79E-04			0.00E+00

Residential Child
West Pad

Table 5-54

Inhalation of Chemicals From Vapors From Soil

Compound	CAS No.	Air Concentration (mg/m3)	Average Daily Dose (mg/kg/day)	Inhalation Reference Dose (mg/kg/day)	Hazard Value	Lifetime Average Daily Dose (mg/kg/day)	Inhalation Slope Factor (mg/kg/day)-1	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	4.90E-07	6.53E-07	2.00E+00	3.27E-07	5.60E-08	NA	--
Ethylbenzene	100-41-4	2.42E-08	3.23E-08	2.90E-01	1.11E-07	2.76E-09	NA	--
Methanol	67-56-1	4.68E-07	6.24E-07	5.00E-01	1.25E-06	5.35E-08	NA	--
Toluene	108-88-3	1.02E-06	1.36E-06	1.10E-01	1.24E-05	1.17E-07	NA	--
Summed:					1.40E-05			0.00E+00

Residential Child
West Pad

Table 5-55

Combined Hazard Index and Lifetime Cancer Risks

Compound	CAS No.	Combined Hazard Index	Theoretical Excess Lifetime Cancer Risks
Xylene	1330-20-7	1.56E-04	0.00E+00
Ethylbenzene	100-41-4	3.48E-04	0.00E+00
Methanol	67-56-1	1.96E-04	0.00E+00
Toluene	108-88-3	1.21E-03	0.00E+00
Summed:		1.91E-03	0.00E+00

6.0 UNCERTAINTY ANALYSIS

This section qualitatively describes the likelihood that the approaches incorporated into this assessment result in underestimates or overestimates of the risk conclusions. Regulatory risk assessment in general, as it is currently practiced, is highly conservative and often focused on an absolute worst case scenario. The Closure Plan Guidance required by OEPA extends beyond that recommended even by the U.S. EPA in the "Risk Assessment Guidance for Superfund" and implements approaches which would not be reproducible in a real situation. Thus, the risks documented in this report are far in excess of those which would ever be anticipated to actually occur. The specific aspects of this assessment which produce those conclusions are noted below for each aspect of the risk assessment:

Representative Chemical Concentrations: OEPA (1991) requires the use of the highest detected chemical concentration as the representative concentration and the inclusion of any chemical detected above background levels in the risk assessment. This unrealistically conservative approach is in excess of that recommended by the U.S. EPA (1989b) and in excess of that required to meet the National Contingency Plan's stated goal of "protection of public health and the environment" (U.S. EPA, 1986a). The U.S. EPA typically requires the use of the 95% upper confidence limit on the arithmetic mean of a distribution of values, while the actual likelihood of exposure to chemicals is reflected in a geometric mean. The most appropriate description of exposure, and the most reflective of reality, is the use of stochastic methodologies, commonly referred to as "Monte Carlo" modeling.

Likelihood of Hypothetical Residential Land Use Actually Occurring: A critical conceptual aspect of the risk assessment is the assumed future land use. OEPA specifies that a residential setting must be addressed for risk assessment parameters for closure plans (1991). The probability that a residential development would be built on the site 10 or 50 years from now is extremely small, since the current owner has operated the facility for 30 years and intends to continue operations indefinitely.

Exposure Factors: OEPA has required that all chemicals detected in each area and their maximum concentrations be incorporated into the risk assessment. Considering a 30- year residential lifetime, it is difficult to conceive of a situation in which an individual would ingest soil, touch soil, ingest water, touch water, inhale volatiles, inhale particulates every day for that period. Each factor incorporated into the quantitative analysis of those exposures is at or above the 95% upper limit of the range of possible values for that factor. Thus, the hypothetical individual in question is at the 95% level for exposure in every conceivable manner. This exceeds the U.S. EPA's intent to achieve an analysis based on "reasonable maximum exposure" (1989b) and is not consistent with a real possibility for exposure. In addition, the summation of multiple factors at the 95% level leads to a summed conclusion value that is far in excess of 95%, and is likely to reach the 99.99% percentile.

Chemical Fate and Transport: A number of aspects of actual human exposure to chemicals in the environment are not accommodated in OEPA guidance. During a 30 year lifetime of exposure, assuming the chemical source is removed, chemical concentrations in any medium will decrease in a specific location. This may be due to biotic degradation, abiotic degradation, or attenuation (dispersion). The rate of decrease will be due to a multitude of environmental factors such as air, soil, or water conditions, chemical-specific factors such as volatility, solubility, or soil mobility, and physical conditions, such as sunlight. The resulting lower chemical concentrations will result in lower doses to exposed receptors. In many cases, modeling may incorporate factors to account for this loss, however, it was not incorporated into this assessment. For ground water, the example is most obvious. Under the conditions of the closure guidance, a receptor is assumed to drink 2 liters of water per day for 30 years containing chemicals consistent with the leaching of the highest detected concentration of each chemical in the area of concern. This overestimates the likely exposure to chemicals in groundwater.

Dose-Response: Regulatory approaches to risk assessment have required the identification of toxic potency factors for chemicals. For non-carcinogens, a hazard value has been identified on a chemical-specific basis. For putative carcinogens, the "cancer slope factor" has been used to derive an estimate of cancer potency. Because the slope factor is an upper 95th percentile confidence limit of the probability of a response based usually on experimental animal data, the resulting carcinogenic risk estimate will also be an upper-bound estimate. This means that the "true risk" will not exceed the risk estimate derived through the use of this model. This highly conservative approach will safely not produce an underestimate of the risk, however, even the Carcinogen Assessment Group of U.S. EPA (1986b) estimates that the lower limit of risk may be as low as zero. When biological factors are further considered, the best estimate of the risk at very low levels is often zero (Ames, 1987; Ames and Gold, 1991; USOMB, 1991).

7.0 CONCLUSION

The results for the three areas of concern, the Incinerator Area, the South Pad and the West Pad incorporating the selection of chemicals of concern, exposure assessment, dose-response assessment, and risk characterization approaches required by OEPA for RCRA closure, indicate that noncancer hazards and theoretical excess lifetime cancer risks are below the limits established in the Closure Plan Review Guidance Manual by the OEPA (1991), even with the incorporation of the unrealistically conservative approaches required by OEPA. No subsequent evaluation or post-closure monitoring is recommended.

8.0 REFERENCES

Andrew, F.D., R.L. Bushbom (1981), Teratologic Assessment of Ethylbenzene and 2-Ethoxyethanol. Battelle Pacific North West Laboratory, Richland, WA. PB83-208074., 108.

Ames, B. (1987) Six common errors relating to environmental pollution. Reg. Toxicol. Pharmacol. 7:379-383.

Ames, B. and Gold, L. (1991) Cancer prevention strategies greatly exaggerate risk. Chem. Engin. News. January 7, 28-47.

Baes, C.F. and R.D. Sharp (1983) A Proposal for Estimation of Soil Leaching Constants for Use in Assessment Models. Journal of Environmental Quality, 12:1.

Burek, J.D., K.D. Nitschke, T.J. Bell, et al. (1984) Methylene Chloride: A Two Year Inhalation Toxicity and Oncogenicity Study in Rats and Hamsters. Fund. Appl. Toxicol. 4:30-47.

Byard, S.C. (1989) Linear Release of Vinyl Chloride from Shower Water. Atmos. Environ. 17:677-692.

CRC (1990) Handbook of Chemistry and Physics, 3rd Edition. Lewis Publishers; Chelesa, Michigan.

Driver, J.H., J.J. Konz, G.K. Whitmyre (1989) Soil Adherence to Human Skin. Bull. Environ. Contam. Toxicol. 43(6):814-820.

Dow Chemical Company (1982) Methylene Chloride: A Two-Year Inhalation and Oncogenicity Study in Rats. Toxicology Research Laboratory, Health and Environmental Sciences, DOW Chemical Company, Midland, MI.

Engineering Sciences (1991) PPG Industries, Inc., Circleville, Ohio. Partial Closure Plan.

Flynn, G.L. (1990) Physiochemical Determinants of Skin Absorption. Pg. 93-127. T.R. Gerity and C.J. Henry, Eds., Principles of Route-to-Route Extrapolation for Risk Assessment. Elsevier Science Publishing Co., Inc.

Foo, S.C., J. Jeyaratnam and D. Koh (1990) Chronic Neurobehavioral Effects of Toluene. Br. J. Prd. Med. 47 (7): 480-484.

Freeze, R.A. and J.A. Cherry (1979) Groundwater, pp. 303. Prentice-Hall, Englewood Cliffs, New Jersey.

Friendlander, B.R., F.T. Hearne and S. Hall (1978) Epidemiologic Investigation of Employees Chronically Exposed to Methylene Chloride. J. Occup. Med. 20(10): 657-666.

Gerahty, J.J., D.W. Miller, F. Van DeLeeden, F.L. Troise (1973) Water Atlas of the United States. Port Washington, New York, Water Information Center.

Hearne, F.T., F. Brase, J.W. Pifer and B.R. Friendlander (1986) Methylene Chloride Mortality Study Update. Eastman Kodak Company, Rochester, N.Y. June 16.

Hearne, F.T., F. Brase, J.W. Pifer, B.R. Friendlander, and R.L. Raleigh (1987) Methylene Chloride Mortality Study: Dose Response Characterization and Animal Model Comparison. J. Occup. Med. 29(3): 217-228.

Hearne, F.T. and B.R. Friendlander (1981) Follow-Up of Methylene Chloride Study. J. Occup. Med. 23:660.

Hwang, S.T., and J.W. Falco (1986) Estimation of Multimedia Exposure Related to Hazardous Waste Facilities, Cohen, Y. (ed). Plenum Publishing Corp.

Klaasen, C.D., M.O. Amdur, and J. Doull (1986) Casarett and Doull's Toxicology: The Basic Science of Poisions, 3rd edition. Casarett and Doull, eds. MacMillan Publishing, New York.

Lyman, W.J., W.F. Reehl, and D.H. Rosenblatt (1982) Handbook of Chemical Properties Estimation. McGraw-Hill, New York, N.Y.

Montgomery, J.H. and L.M. Welkom (1990) Groundwater Chemicals Desk Reference: Lewis Publishers, Chelsea, Michigan.

Morris, D.A. and A.I. Johnson (1967) Summary of Hydrologic and Physical Properties of Rock and Soil Materials. USGS Water Supply, 1839-D.

Munro, I.C. and D.R. Krewski (1981) Risk Assessment and Regulatory Decision-Making. Food Cosmet. Toxical. 19:549-560.

National Academy of Sciences (1983) National Academy of Sciences. Risk Assessment in the Federal Government: Managing the Process. National Academy Press, Washington, D.C.

National Coffee Association (1982) Twenth-Four-Month Chronic Toxicity and Oncogenicity Study of Methylene Chloride in Rats. Final Report. Prepared by Hazeleton Laboratories, America, Inc., Vienna, VA.

National Coffee Association (1983) Twenty-Four-Month Oncogenicity Study of Methylene Chloride in Mice. Final Report. Prepared by Hazelton Laboratories, America, Inc., Vienna, VA.

National Toxicology Program (1986a). Toxicology and Carcinogenesis Studies of Methylene Chloride. NTP-TRS-306.

National Toxicology Program (1986b). Toxicology and Carcinogenesis Studies of Xylenes. NTP TR 327. NIH PB No. 86-2583.

National Toxicology Program (1989). Toxicology and Carcinogenesis Studies of Toluene. Technical Report Series No. 371.

Nitschke, K.D., J.D. Bured, T.J. Bell, et al. (1988) Methylene Chloride: A 2-Year Inhalation Toxicity and Oncogenicity Study in Rats. Fund. Appl. Toxicol. 11:48-59.

Ohio Environmental Protection Agency (1991) Closure Plan Review Guidance. Division of Solid and Hazardous Waste Management.

Ott, M.G., L.K. Skory, B.B. Holder, J.M. Bronson and P.R. Williams (1983) Health Evaluation of Employees Occupationally Exposed to Methylene Chloride. Mortality. Scand. J. Work Environ. 9 (Suppl.1):8-16.

Perry, J.T. (1990) Chemical Engineers Handbook. McGraw-Hill, New York, N.Y.

Preuss, P.W., and A.M. Ehrlich (1987) The Environmental Protection Agency's Risk Assessment Guidelines. Jour. Air Pollution Control Assn. 37:784-791.

Roels, H., J.P. Buchet, R.R. Lauwerys, P. Bruaux, F. Claeys - Thoreau, A. Lafontaine, and G. Verduyn. (1980) Exposure to Lead by the Oral and Pulmonary Routes of Children Living in the Vicinity of a Lead Smelter. Environment 22:81-94.

Ryan, E.A., E.T. Hawkins, B. Magee, S.L. Santos (1987) Assessing Risk From Dermal Exposures at Hazardous Waste Sites. Superfund '87 Proceedings of the 8th National Conference, Nov. 16 - 18, Washington, D.C. Hazardous Materials Control Research Institute.

Schwendeman, T.B. (1989) External Tank Release Detection and Monitoring, in: Underground Storage Systems, pp. 55. Lewis Publishers, Chelsea, Michigan.

U.S. EPA (1973) Investigation of Fugitive Dust - Sources, Emissions and Control. NTIS PB-226693.

U.S. EPA (1974) Development of Emission Factors for Fugitive Dust Sources. NTIS PB-238262.

U.S. EPA (1985) Compilation of Air Pollutant Emission Factors. Vol. I: Stationary Point and Area Sources. Fourth Edition. NTIS PB86-124906.

U.S. EPA (1986a) Guidelines for the Health Risk Assessment of Chemical Mixtures. Federal Register 51:34014.

U.S. EPA (1986b) Guidelines for Carcinogen Risk Assessment. Federal Register 51:33992.

U.S. EPA (1986c) Rat Oral Subchronic Toxicity Study with Methanol. Office of Solid Waste, Washington, D.C.

U.S. EPA (1986d) Evaluation and Selecting Models for Estimating Air Emissions from Hazardous Waste Treatment, Storage and Disposal Facilities. Office of Air Quality Planning and Standards. EPA/450/3-86/020.

U.S. EPA (1987) Update to the Health Assessment Document and Addendum for Methylene Chloride: Pharmacokenetics, Mechanism of Action and Epidemiology. Review Draft. Office of Health and Environmental Assessment, Washington, D.C. EPA 1600/8-87/030A.

U.S. EPA (1988a) Estimating Exposures. Office of Health and Environmental Assessment. EPA/600/6-88/005A.

U.S. EPA (1988b) Superfund Exposure Assessment Manual. Office of Emergency and Remedial Response. EPA/540/1-88/001.

U.S. EPA (1989a) Exposure Factors Handbook. Exposure Assessment Group. EPA/600/8-89/043.

U.S. EPA (1989b) Risk Assessment Guidance for Superfund. Volume I. Human Health Evaluation Manual. EPA/540/1-89/002.

U.S. EPA (1991) Health Effects Assessments Summary Tables. Annual FY-1991. Office of Emergency and Remedial Response. NTIS PB91-921199.

U.S. EPA (1992a) Integrated Risk Information System (IRIS). On-line.

U.S. EPA (1992b) Health Effects Assessments Summary Tables. Annual 1992. Office of Emergency and Remedial Response. NTIS PB92-921102.

Wolf, M.A., V.K. Rowe, D.D. McCollister, R.L. Hollingsworth and F. Ogen (1986). Toxicological Studies of Certain Alkylated Benzenes. Arch. Ind. Health. 14:387-398.

APPENDIX A

DATA SUMMARY

DATA SUMMARY
PPG INDUSTRIES, INC.
CIRCLEVILLE, OHIO

SEPTEMBER, 1992

Sample Number	Sample Location	Sampling Grid	Sample Date	Depth (in.)	Analytical EPA SW-846 Method	Initial Analytical Results
CV-92-330-I34	Incinerator Pad	34	9-24-92	6-12	8240	Non-Detect
CV-92-331-I34	Incinerator Pad	34	9-24-92	12-24	8240	Not Analyzed
CV-92-332-I36	Incinerator Pad	36	9-24-92	6-12	8240	Non-Detect
CV-92-333-I36	Incinerator Pad	36	9-24-92	12-24	8240	Not Analyzed
CV-92-334-I56	Incinerator Pad	56	9-24-92	6-12	8240	Non-Detect
CV-92-335-I56	Incinerator Pad	56	9-24-92	12-24	8240	Not Analyzed
CV-92-336-I113	Incinerator Pad	113	9-24-92	6-12	8240	Non-Detect
CV-92-337-I113	Incinerator Pad	113	9-24-92	12-24	8240	Not Analyzed
CV-92-338-I24	Incinerator Pad	24	9-24-92	12-24	8240	Not Analyzed
CV-92-339-I45	Incinerator Pad	45	9-24-92	12-24	8240	Not Analyzed
CV-92-524-52A	Incinerator Pad	24	10-31-92	12-24	8240	21 ppb Methylene Chloride
CV-92-525-I45	Incinerator Pad	45	10-31-92	12-24	8240	13 ppb Methylene Chloride
CV-92-340-W45	West Storage Pad	45	9-23-92	6-12	8240	Non-Detect
CV-92-341-W45	West Storage Pad	45	9-23-92	12-24	8240	Not Analyzed
CV-92-342-W51	West Storage Pad	51	9-23-92	6-12	8240	Non-Detect
CV-92-343-W51	West Storage Pad	51	9-23-92	12-24	8240	Not Analyzed
CV-92-344-W56	West Storage Pad	56	9-23-92	6-12	8240	Non-Detect
CV-92-345-W56	West Storage Pad	56	9-23-92	12-24	8240	Not Analyzed
CV-92-346-W60	West Storage Pad	60	9-23-92	6-12	8240	Non-Detect
CV-92-347-W60A	West Storage Pad	60	9-23-92	6-12	8240	Non-Detect
CV-92-359-W60A	West Storage Pad	60	9-23-92	12-24	8240	Not Analyzed

DATA SUMMARY (Continued)
PPG INDUSTRIES, INC.
CIRCLEVILLE, OHIO

SEPTEMBER, 1992

Sample Number	Sample Location	Sampling Grid	Sample Date	Depth (in.)	Analytical EPA SW-846 Method	Initial Analytical Results
CV-92-348-W6	West Storage Pad	6	9-23-92	12-24	8240	Not Analyzed
CV-92-349-W44	West Storage Pad	44	9-23-92	12-24	8240	Not Analyzed
CV-92-W6	West Storage Pad	6	10-31-92	12-24	8240	Non-Detect
CV-92- -W44	West Storage Pad	44	10-31-92	12-24	8240	Non-Detect
CV-92-350-S79	South Storage Pad	79	9-23-92	6-12	8240	6 ppb MIBK
CV-92-351-S79	South Storage Pad	79	9-23-92	12-24	8240	Non-Detect
CV-92-354-S152	South Storage Pad	152	9-23-92	6-12	8240	Non-Detect
CV-92-355-S152	South Storage Pad	152	9-23-92	12-24	8240	Not Analyzed
CV-92-360-S146	South Storage Pad	146	9-24-92	6-12	8240	Non-Detect
CV-92-353-S146	South Storage Pad	146	9-24-92	12-24	8240	Not Analyzed
CV-92-356-S100	South Storage Pad	100	9-23-92	12-24	8240	Not Analyzed
CV-92-526-S100	South Storage Pad	100	10-31-92	12-24	8240	31 ppb Methylene Chloride

PPB: Parts Per Billion

SAMPLE SUMMARY
PPG INDUSTRIES, INC.
CIRCLEVILLE,OHIO

JANUARY,1991

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
CV-89-0221	–	7137	CV-89-0221	Still Pad	M.H. Sediment Sample	17-Apr-89	@ Right	BDL	mg/kg	1.0	Analysis for Methanol, Iso-butanol, Butanol & Butyl Callosolve
						17-Apr-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL except below
						17-Apr-89	Ethylbenzene	2.48	mg/kg	0.167	
						17-Apr-89	Meth. Chloride	0.228	mg/kg	0.167	
						17-Apr-89	Xylenes	0.335	mg/kg	0.167	
						17-Apr-89	@ Right	BDL	mg/kg	1.0	Analysis for 9 PCBs all BDL except below
						17-Apr-89	Aroclor 1248	6,700	mg/kg	1.0	
CV-89-0223	--	7137	CV-89-0222	Still Pad	Pipe Sediment Sample	17-Apr-89	@ Right	BDL	mg/kg	1.0	Analysis for Methanol, Iso-butanol, Butanol, & Butyl Callosolve
						17-Apr-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL except below
						17-Apr-89	MEK	15.3	mg/kg	4.00	
						17-Apr-89	Xylenes	167.5	mg/kg	4.00	
						17-Apr-89	@ Right	BDL	mg/kg	1.0	Analysis for 9 PCBs all BDL except below
						17-Apr-89	Aroclor 1248	41,400	mg/kg	1.0	
CV-89-0223	–	7137	CV-89-0223	Still Pad	3rd Rinse	17-Apr-89	@ Right	BDL	mg/kg	1.0	Analysis for Methanol, iso-butanol, & Butanol
						17-Apr-89	Butyl Cellosolve	85.4	mg/L	1.0	Initial run results shown, confirmed @ 84.1 mg/L
						17-Apr-89	@ Right	BDL	µg/L	Varies	Analysis for HSL Volatiles all BDL except below
						17-Apr-89	Meth. Chloride	169	µg/L	100	
						17-Apr-89	@ Right	BDL	µg/L	1.0	Analysis for a PCBs and BDL
CV-89-0224	--	7137	CV-89-0224	Still Pad	Rinsewater Source	17-Apr-89	@ Right	BDL	mg/L	1.0	Anlysis for iso-butanol, Butanol, & Butyl Cellosolve
						17-Apr-89	Methanol	6.95	mg/L	1.0	
						17-Apr-89	@ Right	BDL	µg/L	Varies	Analysis for HSL Volatiles all BDL except below
						17-Apr-89	Acetone	22.3	µg/L	10.0	
						17-Apr-89	Meth. Chloride	3.2	µg/L	2.00	
						17-Apr-89	@ Right	BDL	µg/L	1.0	Analyses for 9 PCBs all BDL
8-131	S-131	7137	JC5491	South Pad	Soil Sample	17-Jul-89	@ Right	BDL	mg/kg	0.965	Analysis for n-Butanol, isobutanol, and Methanol
						17-Jul-89	@ Right	BDL	mg/kg	Varie:	Analysis for HSL Volatiles all BDL except below
						17-Jul-89	Toluene	2	mg/kg	0.3	
003	S-132	7137	JC5492	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.952	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatics all BDL
004	S-135	7137	JC5493	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.972	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	0.972	Analysis for HSL Volatiles all BDL except below
						18-Jul-89	Xylenes	0.11	mg/kg	0.3	
005	S-136	7137	JC5494	South pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.950	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL except below
						18-Jul-89	Xylenes	0.6	mg/kg	0.3	
006	S-137	7137	JC5495	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.971	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
007	S-140	7137	JC5496	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.960	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
008	S-130	7137	JC5497	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.958	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL

SAMPLE SUMMARY (Continued)
PPG INDUSTRIES, INC.
CIRCLEVILLE,OHIO

JANUARY,1991

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
009	S-129	7137	JC5498	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.967	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
010	S-126	7137	JC5499	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.950	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Toluene	0.4	mg/kg	0.3	
011	S-124	7137	JC5500	South pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.952	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
012	S-121	7137	JC5501	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.952	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
013	S-107	7137	JC5502	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.971	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Meth. Chloride	0.3	mg/kg	0.3	
						18-Jul-89	Toluene	0.4	mg/kg	0.3	
014	S-109	7137	JC5503	South pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.992	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
015	S-109	7137	JC5530	Souh Pad	Soil Sample (Dupl. S-109)	18-Jul-89	@ Right	BDL	mg/kg	0.969	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Xylenes	0.6	mg/kg	0.3	
016	S-113	7137	HC5504	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.993	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
017	S-111	7137	JC5505	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.967	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
018	S-112	7137	JC5506	South Pad	Soil Sample	18-July-89	@ Right	BDL	mg/kg	0.977	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Toluene	0.4	mg/kg	0.3	
019	S-115	7137	JC5507	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.973	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
020	S-102	7137	JC5508	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.960	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
021	S-100	7137	JC5509	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.964	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Ethylbenzene	2	mg/kg	0.6	
						18-Jul-89	Meth. Chloride	0.3	mg/kg	0.3	
						18-Jul-89	Toluene	21	mg/kg	0.3	
						18-Jul-89	Xylenes	8	mg/kg	0.3	
022	S-96	7137	JC5510	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.991	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL

SAMPLE SUMMARY (Continued)
PPG INDUSTRIES, INC.
CIRCLEVILLE,OHIO

JANUARY,1991

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
023	S-93	7137	JC5511	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.988	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
024	S-80	7137	JC5512	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.964	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Toluene	0.5	mg/kg	0.3	
025	S-88	7137	JC5513	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.999	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Meth. Chloride	0.5	mg/kg	0.3	
						18-Jul-89	Toluene	2	mg/kg	0.3	
026	S-82	7137	JC5514	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.957	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
C541	C541	7137	JC5541	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.25	Analysis for 7 PCBs all BDL, except below
						18-Jul-89	Arclor 1254	0.334	mg/kg	0.25	
027	S-77	7137	JC5515	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.966	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Meth. Chloride	0.3	mg/kg	0.3	
028	S-71	7137	JC5516	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.993	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Ethylbenzene	0.3	mg/kg	0.3	
						18-Jul-89	Toluene	17	mg/kg	0.3	
						18-Jul-89	Xylenes	0.16	mg/kg	0.3	
029	S-72	7137	JC5517	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	1.000	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Ethylbenzene	0.4	mg/kg	0.3	
						18-Jul-89	Meth. Chloride	0.3	mg/kg	0.3	
						18-Jul-89	Xylenes	0.18	mg/kg	0.3	
030	S-70	7137	JC5518	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.960	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
031	S-69	7137	JC5519	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.990	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Ethylbenzene	0.3	mg/kg	0.3	
						18-Jul-89	Meth. Chloride	3	mg/kg	0.3	
						18-Jul-89	Toluene	1	mg/kg	0.3	
						18-Jul-89	Xylenes	1.8	mg/kg	0.3	
032	S-65	7137	JC5520	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.974	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Meth. Chlorde	0.8	mg/kg	0.3	

SAMPLE SUMMARY (Continued)
PPG INDUSTRIES, INC.
CIRCLEVILLE,OHIO

JANUARY,1991

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
033	S-65	7137	JC5540	South Pad	Soil Sample (Dupl. S-55)	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Meth. Chloride	BDL BDL 0.3	mg/kg mg/kg mg/kg	0.977 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
034	S-58	7137	JC5521	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Meth. Chloride Toluene	BDL BDL 0.3 0.3	mg/kg mg/kg mg/kg mg/kg	0.962 Varies 0.3 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
035	S-61	7137	JC5522	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Toluene	BDL BDL 0.3	mg/kg mg/kg mg/kg	0.976 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
036	S-49	7137	JC5523	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.953 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
037	S-44	7137	JC5524	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.952 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
038	S-40	7137	JC5525	South Pad	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Toluene	BDL BDL 0.4	mg/kg mg/kg mg/kg	0.964 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
039	S-26	7137	JC5526	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.961 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
040	S-34	7137	JC5527	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.961 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
041	S-31	7137	JC5526	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.965 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
042	S-38	7137	JC5529	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.970 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
043	S-26	7137	JC5530	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.966 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
044	S-24	7137	JC5531	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.953 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
045	S-21	7137	JC5532	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.960 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
046	S-17	7137	JC5533	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	1.000 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
047	S-5	7137	JC5534	South Pad	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.979 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL

SAMPLE SUMMARY (Continued)
PPG INDUSTRIES, INC.
CIRCLEVILLE,OHIO

JANUARY,1991

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
048	S-14	7137	JC5535	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.999	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
049	S-9	7137	JC5536	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.996	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
050	S-11	7137	JC5537	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.993	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
051	S-13	7137	JC5538	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.983	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
C544	C544	7137	JC5542	South Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.25	Analysis for 7 PCBs and BDL, except below
						18-Jul-89	Aroclor 1254	3.56	mg/kg	0.25	
052	--	7137	JC5552	General	Water Sample (Trip Blank)	18-Jul-89	@ Right	BDL	mg/L	1.000	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/L	Varies	Analysis for HSL Volatiles all BDL
053	W-44	7137	JC5543	West Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.988	Analysis for n-Butanol and Isobutanol
						18-Jul-89	Methanol	0.968	mg/kg	0.968	Only detected alcohol in West Pad soils
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles, all BDL except below
						18-Jul-89	Toluene	1.34	mg/kg	0.196	
054	W-21	7137	JC5544	West pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.952	Analysis for n-Butanol, Isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
055	W-30	7137	JC5545	West Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.958	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
056	W-40	7137	JC5548	West Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.988	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
057	W-6	7137	JC5547	West Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.964	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Ethylbenzene	0.229	mg/kg	0.186	
						18-Jul-89	Xylenes	2.16	mg/kg	0.186	
058	W-38	7137	JC5548	West Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.973	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Toluene	0.621	mg/kg	0.190	
059	W-15	7137	JC5549	West Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.977	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
060	W-26	7137	JC5550	West Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.944	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
061	W-12	7137	JC5551	West Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.979	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Xylenes	0.454	mg/kg	0.199	

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
C542	C542	7137	JC5554	West Pad	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.25	Analysis for 7 PCBs, all BDL
062	W-12	7137	JC5553	West Pad	Soil Sample (Dupl. W-12)	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.996 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
063	I-9	7137	JC5556	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Rigut	BDL BDL	mg/kg mg/kg	0.975 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
064	I-44	7137	JC5556	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.929 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
065	I-77	7137	JC5557	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.958 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
066	I-64	7137	JC5558	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Ethylbenzene Xylenes	BDL BDL 0.3 0.9	mg/kg mg/kg mg/kg mg/kg	0.967 Varies 0.3 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except BDL
067	I-85	7137	JC5559	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Ethylbenzene Xylenes	BDL BDL 0.6 0.7	mg/kg mg/kg mg/kg mg/kg	0.996 Varies 0.3 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
068	I-106	7137	JC5560	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.991 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
069	I-72	7137	JC5561	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.962 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
070	I-72	7137	JC5573	Incinerator Area	Soil Sample (Dupl. I-72)	18-Jul-89 18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Meth. Chloride Xylenes	BDL BDL 0.4 1.7	mg/kg mg/kg mg/kg mg/kg	0.933 Varies 0.3 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
071	I-92	7137	JC5562	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	1.000 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
072	I-70	7137	JC5563	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89 18-Jul-89	@ Right @ Right Meth. Chloride	BDL BDL 0.3	mg/kg mg/kg mg/kg	0.944 Varies 0.3	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL, except below
073	I-76	7137	JC5564	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.932 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
074	I-26	7137	JC5565	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.990 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL
075	I-58	7137	JC5566	Incinerator Area	Soil Sample	18-Jul-89 18-Jul-89	@ Right @ Right	BDL BDL	mg/kg mg/kg	0.955 Varies	Analysis for n-Butanol, isobutanol, and Methanol Analysis for HSL Volatiles all BDL

SAMPLE SUMMARY (Continued)
PPG INDUSTRIES, INC.
CIRCLEVILLE,OHIO

JANUARY,1991

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
076	I-6	7137	JC5567	Incinerator Area	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.991	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL
077	I-24	7137	JC5568	Incinerator Area	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.969	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Ethylbenzene	2	mg/kg	0.3	
						18-Jul-89	Meth. Chloride	4	mg/kg	0.3	
						18-Jul-89	Xylenes	4	mg/kg	0.3	
078	I-26	7137	JC5569	Incinerator Area	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.992	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Meth. Chloride	0.4	mg/kg	0.3	
079	I-48	7137	JC5670	Incinerator Area	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.978	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Xylenes	0.4	mg/kg	0.3	
080	I-45	7137	JC5571	Incinerator Area	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.945	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Ethylbenzene	0.6	mg/kg	0.3	
						18-Jul-89	2-Hexanone	3	mg/kg	0.6	
						18-Jul-89	Meth. Chloride	0.4	mg/kg	0.3	
						18-Jul-89	Xylenes	2	mg/kg	0.3	
081	I-60	7137	JC5572	Incinerator Area	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.931	Analysis for n-Butanol, isobutanol, and Methanol
						18-Jul-89	@ Right	BDL	mg/kg	Varies	Analysis for HSL Volatiles all BDL, except below
						18-Jul-89	Meth. Chloride	0.4	mg/kg	0.3	
C543	C543	7137	JC5574	Incinerator Area	Soil Sample	18-Jul-89	@ Right	BDL	mg/kg	0.25	Analysis for 7 PCBs all BDL except below
						18-Jul-89	Aroclor 1254	1.79	mg/kg	0.25	
						18-Jul-89	@ Right	BDL	µg/kg	Varies	Analysis for 12 Cibenzo-P-Dioxins & Furene all BDL except below
						18-Jul-89	HpCDD	0.37	µg/kg	--	
						18-Jul-89	OCDD	1.91	µg/kg	--	
						18-Jul-89	2,37,8-TCDF	0.15	µg/kg	--	
						18-Jul-89	TCDF	0.22	µg/kg	--	
085	--	7137	085	Incinerator	Final Phase Line 2	24-Aug-89	Methanol	93.1	mg/L	1.0	
						24-Aug-89	Iso-Butanol	10.1	mg/L	1.0	
						24-Aug-89	Butanol	86.3	mg/L	1.0	
						24-Aug-89	@ Right	BDL	µg/L	Varies	
						24-Aug-89	2-Butanone	39,000	µg/L	1,000	Analysis for HSL, Volatiles all BDL except below
						24-Aug-89	Ethylbenzene	36,000	µg/L	500	
						24-Aug-89	2-Hexanone	720,000	µg/L	1,000	
						24-Aug-89	Toluene	75,000	µg/L	500	
						24-Aug-89	Xylenes	240,000	µg/L	500	
086	--	7137	086	Incinerator	Distilled Rinse Water	24-Aug-89	@ Right	BDL	mg/L	1.0	Analysis for n-Butanol, isobutanol, and Methanol
						24-Aug-89	@ Right	BDL	µg/L	Varies	Analysis for HSL Volatiles all BDL, except below
						24-Aug-89	Toluene	170	µg/L	6	

SAMPLE SUMMARY (Continued)
PPG INDUSTRIES, INC.
CIRCLEVILLE,OHIO

JANUARY,1991

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
087	–	7137	087	Incinerator	Service Water	24-Aug-89	@ Right	BDL	mg/L	1.0	Analysis for n-Butanol, isobutanol, and Methanol
						24-Aug-89	@ Right	BDL	µg/L	Varies	Analysis for HSL Volatiles all BDL
088	–	7137	088	Incinerator	Travel Blank	24-Aug-89	@ Right	BDL	µg/L	Varies	Analysis for HSL Volatiles all BDL
089	–	7137	089	Incinerator	Final Rinse Line 1	24-Aug-89	Methanol	16.5	mg/L	1.0	
						24-Aug-89	Iso-butanol	1.71	mg/L	1.0	
						24-Aug-89	Butanol	18.9	mg/L	1.0	
						24-Aug-89	@ Right	BDL	µg/L	Varies	
						24-Aug-89	2-Butanone	11,000	µg/L	1,000	Analysis for HSL Volatiles all BDL, except below
						24-Aug-89	Ethylbenzene	24,000	µg/L	1,000	
						24-Aug-89	2-Hexanone	300,000	µg/L	1,000	
						24-Aug-89	Toluene	33,000	µg/L	600	
						24-Aug-89	Xylenes	180,000	µg/L	600	
090	–	7137	090	Incinerator	Final Rinse Aqueous Waste	24-Aug-89	@ Right	BDL	mg/L	1.0	
						24-Aug-89	@ Right	BDL	µg/L	Varies	Analysis for n-Butanol, isobutanol, and Methanol
						24-Aug-89	Ethylbenzene	9,900	µg/L	500	Analysis for HSL Volatiles all BDL, except below
						24-Aug-89	2-Hexanone	1,900	µg/L	1,000	
						24-Aug-89	Toluene	15,000	µg/L	500	
						24-Aug-89	Xylenes	31,000	µg/L	500	

DETECTED COMPOUND SUMMARY

JANUARY,1991

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
CV-89-0221	-	7137	CV-89-0221	STILL PAD	M.H. SEDIMENT SAMPLE	17-Apr-89	ETHYLBENZENE	2.48	mg/kg	0.167	
						17-Apr-89	METH. CHLORIDE	0.228	mg/kg	0.167	
						17-Apr-89	XYLENES	0.335	mg/kg	0.167	
						17-Apr-89	ARCOCLOR 1248	6,700	mg/kg	1.0	
CV-89-0222	-	7137	CV-89-0222	STILL PAD	PIPE SEDIMENT SAMPLE	17-Apr-89	MEK	15.3	mg/kg	4.00	
						17-Apr-89	XYLENES	167.5	mg/kg	4.00	
						17-Apr-89	AROCLOR 1248	41,400	mg/kg	1.0	
CV-89-0223	-	7137	CV-89-0223	STILL PAD	3rd RINSE	17-Apr-89	BUTYL CELLOSOLVE	85.4	mg/L	1.0	Initial run results shown, confirmed @ 84.1 mg/L
						17-Apr-89	METH. CHLORIDE	169	ug/L	100	
CV-89-0224	-	7137	CV-89-0224	STILL PAD	RINSEWATER SOURCE	17-Apr-89	METHANOL	6.95	mg/L	1.0	
						17-Apr-89	ACETONE	22.3	ug/L	10.0	
						17-Apr-89	METH. CHLORIDE	3.2	ug/L	2.0	
S-131	S-131	7137	S-131	SOUTH PAD	SOIL SAMPLE	17-Jul-89	TOLUENE	2	mg/kg	0.3	
004	S-135	7137	004	SOUTH PAD	SOIL SAMPLE	18-Jul-89	XYLENES	0.11	mg/kg	0.3	
005	S-136	7137	005	SOUTH PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.8	mg/kg	0.3	
010	S-126	7137	010	SOUTH PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.4	mg/kg	0.3	
013	S-107	7137	013	SOUTH PAD	SOIL SAMPLE	18-Jul-89	METH. CHLORIDE	0.3	mg/kg	0.3	
						18-Jul-89	TOLUENE	0.4	mg/kg	0.3	
015	S-109	7137	015	SOUTH PAD	SOIL SAMPLE (DUPL. S-109)	18-Jul-89	XYLENES	0.6	mg/kg	0.3	
018	S-112	7137	018	SOUTH PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.4	mg/kg	0.3	
021	S-100	7137	021	SOUTH PAD	SOIL SAMPLE	18-Jul-89	ETHYLBENZENE	2	mg/kg	0.6	
						18-Jul-89	METH. CHLORIDE	0.3	mg/kg	0.3	
						18-Jul-89	TOLUENE	21	mg/kg	0.3	
						18-Jul-89	XYLENES	8	mg/kg	0.3	
024	S-80	7137	024	SOUTH PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.5	mg/kg	0.3	
025	S-88	7137	025	SOUTH PAD	SOIL SAMPLE	18-Jul-89	METH. CHLORIDE	0.5	mg/kg	0.3	
						18-Jul-89	TOLUENE	2	mg/kg	0.3	
C541	C541	7137	JC6641	SOUTH PAD	SOIL SAMPLE	18-Jul-89	AROCLOR 1254	0.334	mg/kg	0.25	
027	S-77	7137	027	SOUTH PAD	SOIL SAMPLE	18-Jul-89	METH. CHLORIDE	0.3	mg/kg	0.3	
028	S-71	7137	028	SOUTH PAD	SOIL SAMPLE	18-Jul-89	ETHYLBENZENE	0.3	mg/kg	0.3	
						18-Jul-89	TOLUENE	17	mg/kg	0.3	
						18-Jul-89	XYLENES	0.16	mg/kg	0.3	
029	S-72	7137	029	SOUTH PAD	SOIL SAMPLE	18-Jul-89	ETHYLBENZENE	0.4	mg/kg	0.3	
						18-Jul-89	METH. CHLORIDE	0.3	mg/kg	0.3	
						18-Jul-89	XYLENES	0.18	mg/kg	0.3	

DETECTED COMPOUND SUMMARY (Continued)

JANUARY,1991

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
031	S-69	7137	031	SOUTH PAD	SOIL SAMPLE	18-Jul-89	ETHYLBENZENE	0.3	mg/kg	0.3	
						18-Jul-89	METH. CHLORIDE	3	mg/kg	0.3	
						18-Jul-89	TOLUENE	1	mg/kg	0.3	
						18-Jul-89	XYLENES	1.8	mg/kg	0.3	
032	S-55	7137	032	SOUTH PAD	SOIL SAMPLE	18-Jul-89	METH. CHLORIDE	0.8	mg/kg	0.3	
033	S-55	7137	033	SOUTH PAD	SOIL SAMPLE (DUPL. S-55)	18-Jul-89	METH. CHLORIDE	0.3	mg/kg	0.3	
034	S-58	7137	034	SOUTH PAD	SOIL SAMPLE	18-Jul-89	METH. CHLORIDE	0.3	mg/kg	0.3	
						18-Jul-89	TOLUENE	0.3	mg/kg	0.3	
035	S-61	7137	035	SOUTH PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.3	mg/kg	0.3	
038	S-40	7137	038	SOUTH PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.4	mg/kg	0.3	
C544	C544	7137	JC5542	SOUTH PAD	SOIL SAMPLE	18-Jul-89	AROCLOR 1254	3.56	mg/kg	0.25	
053	W-44	7137	JC5543	WEST PAD	SOIL SAMPLE	18-Jul-89	METHANOL	0.968	mg/kg	0.968	Only detected alcohol in West Pad soils
						18-Jul-89	TOLUENE	1.34	mg/kg	0.198	
057	W-6	7137	JC5547	WEST PAD	SOIL SAMPLE	18-Jul-89	ETHYLBENZENE	0.229	mg/kg	0.186	
						18-Jul-89	XYLENES	2.16	mg/kg	0.186	
058	W-38	7137	JC5548	WEST PAD	SOIL SAMPLE	18-Jul-89	TOLUENE	0.621	mg/kg	0.190	
061	W-12	7137	JC5551	WEST PAD	SOIL SAMPLE	18-Jul-89	XYLENES	0.454	mg/kg	0.199	
066	I-64	7137	066	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89	ETHYLBENZENE	0.3	mg/kg	0.3	
						18-Jul-89	XYLENES	0.9	mg/kg	0.3	
067	I-85	7137	067	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89	ETHYLBENZENE	0.6	mg/kg	0.3	
						18-Jul-89	XYLENES	0.7	mg/kg	0.3	
070	I-72	7137	070	INCINERATOR AREA	SOIL SAMPLE (DUPL. I-72)	18-Jul-89	METH. CHLORIDE	0.4	mg/kg	0.3	
						18-Jul-89	XYLENES	1.7	mg/kg	0.3	
072	I-70	7137	072	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89	METH. CHLORIDE	0.3	mg/kg	0.3	
077	I-24	7137	077	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89	ETHYLBENZENE	2	mg/kg	0.3	
						18-Jul-89	METH. CHLORIDE	4	mg/kg	0.3	
						18-Jul-89	XYLENES	4	mg/kg	0.3	
078	I-28	7137	078	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89	METH. CHLORIDE	0.3	mg/kg	0.3	
079	I-48	7137	079	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89	XYLENES	0.4	mg/kg	0.3	
080	I-45	7137	080	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89	ETHYLBENZENE	0.6	mg/kg	0.3	
						18-Jul-89	2-HEXANONE	3	mg/kg	0.6	
						18-Jul-89	METH. CHLORIDE	0.4	mg/kg	0.3	
						18-Jul-89	XYLENES	2	mg/kg	0.3	

SAMPLE #	LOC #	REPORT #	LAB#	LOCATION	DESCRIPTION	SAMPLE DATE	ANALYSIS FOR	RESULTS	UNITS	DETECTION LIMIT	COMMENTS
081	I-50	7137	081	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89	METH. CHLORIDE	0.4	mg/kg	0.3	
C543	C543	7137	JC5574	INCINERATOR AREA	SOIL SAMPLE	18-Jul-89	AROCLOR 1254	1.79	mg/kg	0.25	
						18-Jul-89	HpCDD	0.37	ug/kg	-	
						18-Jul-89	OCDD	1.91	ug/kg	-	
						18-Jul-89	2,3,7,8-TCDF	0.15	ug/kg	-	
						18-Jul-89	TCDP	0.22	ug/kg	-	
085	-	7137	085	INCINERATOR	FINAL RINSE LINE 2	24-Aug-89	METHANOL	93.1	mg/L	1.0	
						24-Aug-89	ISO-BUTANOL	10.1	mg/L	1.0	
						24-Aug-89	BUTANOL	85.3	Mg/L	1.0	
						24-Aug-89	2-BUTANONE	39,000	ug/L	1,000	
						24-Aug-89	ETHYLBENZENE	36,000	ug/L	500	
						24-Aug-89	2-HEXANONE	720,000	ug/L	1,000	
						24-Aug-89	TOLUENE	75,000	ug/L	500	
						24-Aug-89	XYLENES	240,000	ug/L	500	
086	-	7137	086	INCINERATOR	DISTILLED RINSE WATER	24-Aug-89	TOLUENE	170	ug/L	5	
089	-	7137	089	INCINERATOR	FINAL RINSE LINE 1	24-Aug-89	METHANOL	16.5	mg/L	1.0	
						24-Aug-89	ISO-BUTANOL	1.71	mg/L	1.0	
						24-Aug-89	BUTANOL	18.9	mg/L	1.0	
						24-Aug-89	2-BUTANONE	11,000	ug/L	1,000	
						24-Aug-89	ETHYLBENZENE	24,000	ug/L	1,000	
						24-Aug-89	2-HEXANONE	300,000	ug/L	1,000	
						24-Aug-89	TOLUENE	33,000	ug/L	500	
						24-Aug-89	XYLENES	180,000	ug/L	500	
090	-	7137	090	INCINERATOR	FINAL RINSE AQUEOUS WASTE	24-Aug-89	ETHYLBENZENE	9,900	ug/L	500	
						24-Aug-89	2-HEXANONE	1,900	ug/L	1,000	
						24-Aug-89	TOLUENE	15,000	ug/L	500	
						24-Aug-89	XYLENES	31,000	ug/L	500	

ATTACHMENT F

PCB Documentation/Certification

Regarding PPG Industries, Inc. (PPG) Partial Closure Plan for three drum storage areas and the liquid incinerator at the Circleville facility, Ohio EPA issued comments concerning the proposed revision to the Plan in letters dated November 20, 1991 (Comment 2) and dated June 28, 1991 (Comment 2). In order to obtain an approvable closure plan, PPG must demonstrate to Ohio EPA's satisfaction that polychlorinated biphenyl (PCB) levels recorded in these areas are unrelated to RCRA activities, and PPG must provide a statement certifying that none of the hazardous wastes handled at the units contained PCBs.

The results of the PPG's investigation into this matter are organized as follows:

- Since waste characterization is often achieved by knowledge of the process generating the waste, a synopsis of the resin manufacturing process and associated wastes and the relationship of how PCBs were used in the facility is given first.

- The results of the investigation into historical waste analysis reports follows.

- Finally, a summary of analyses of current waste streams consistent with the wastes that were historically stored at the units to be closed is presented.

Resin Manufacturing Process

In the resin manufacturing process, monomers, organic acids, initiators, inhibitors, catalysts, glycols or solvents are combined in a reactor vessel to undergo reactions to form polymers. Some reactions require application of heat to the reactor to produce the desired reaction.

In cases where heat from steam jacketing of the reactor vessel is insufficient, oil is used as a heat transfer media to the reactor jacket because the oil can be heated to a higher temperature than steam. PCB oil (Aroclor 1248) was used for this heat transfer media because of its safety in terms of fire resistance. When the toxicity of PCBs became known, the PCB oil in this system was replaced with non-PCB oil. In early 1972, the hot oil systems at the PPG Circleville facility were drained into a tank truck and the fluid was transported offsite for processing. The systems were flushed with solvent and this material was transferred into a tank truck and transported off site for incineration. Non-PCB heat transfer oil (Therminol 66) was used to fill the systems.

The diagram in Attachment 1 shows an example of the application of the hot oil for heat transfer in the process. When calling for heat on the reactor, hot oil is pumped by the hot oil circulating pump from the furnace through the hot oil piping and through the reactor jacket which is mounted externally to the reactor vessel and then back to the furnace. When the reactor is calling for cooling, the oil flow is diverted by a valve through the cold oil loop. It is cooled in the cool oil fans (air cooled heat exchanger) and recirculated to the reactor jacket.

Another application of heat from the hot oil system is to the reboiler at the partial condenser unit. In this case, hot oil from the furnace is pumped through a tubed heat exchanger which is the reboiler. In both cases, hot oil does not make contact with the product. The heat from the hot oil system is released to the product through the wall of the vessel or through the tubing surface of the reboiler.

Wastes generated from the resin manufacturing process include samples taken during and after the reaction process, wastewater extracted from the process during reflux, solvents used for flushing process vessels between batches, waste resin generated during filtration and material transfer steps. These waste streams are all from the product in the reactor system vessel which has not been combined with, or made contact with, the heat transfer oil. In terms of the generator's knowledge of the process generating these wastes, PCB compounds are not part of the process generating these wastes since PCBs have never been ingredients used in the reactors to make resin polymers.

Historical Waste Analysis

Records pertinent to RCRA waste analysis were searched from 1980 to the present. In the years from 1980 to 1984, waste analysis information which was required for profile approval to dispose of wastes at commercial TSD facilities relied heavily on knowledge of the process generating the waste. Since PCBs were not used in the process materials, no analytical work was done pertaining to these compounds.

A revision to the facility Waste Analysis Plan in 1984 initiated more laboratory analysis, but PCBs were not specified in the Waste Analysis Plan and were not tested in the waste samples. The lab analysis report in Attachment 2 is typical of the lab analysis done at the time.

In 1986, a more comprehensive waste analysis program was started with analytical work performed by NUS Corporation. Lab results from this phase show that PCBs were not specifically analyzed, but a test for organic chlorine was performed on many of the waste samples. Inquiries made to the NUS laboratory indicate that the presence of a PCB compound in the sample should give a positive result on this test. In examination of these lab analysis reports, which are included as Attachment 3, the majority of reports show below the detection or quantification limit for organic chlorine. In the few reports which do show measurable organic chlorine, a correlation can be made to the presence of methylene chloride.

Analysis for PCB compounds was done in the waste analysis program by NUS in 1987. This data is included as Attachment 4. All of these reports show PCBs at less than detection except for one analytical report for a waste stream identified as Cationic Waste Resin which shows 39 mg/kg of PCB-1242. This isolated result is not in accord with the PCB compound Aroclor-1248 formerly used for heat transfer fluid at the facility. The result may be due to laboratory error, or due to the ubiquitous nature of PCBs in the environment.

Current Waste Analyses

Since 1987, waste analytical data from receipt samples at the Energy Recovery Unit has fulfilled most of the waste analysis requirements for the Circleville plant. Analysis for PCBs is a routine part of this testing. RCRA waste streams from the Circleville manufacturing plant have not shown presence of PCBs. Attachment 5 includes annual summaries from receipt samples of all current waste streams which are comparable to those that were previously stored in the units to be closed.

The RCRA wastes previously stored at the Waste Drum Storage Areas and the comparable currently generated waste streams can be summarized as follows:

- Waste Resin, D001, (alkyd, acrylic, polyester or epoxy polymers dispersed or dissolved in one or more of the following solvents: xylene, ethylbenzene, methyl isobutyl ketone, methanol, toluene, or methyl ethyl ketone). The following current waste streams documented in Attachment 5 are comparable: CRXADRC101, CRXADRC102, CRXADRC104, CRXDRSF111, CRXODRF101, CRXODRF102.

- Spent stripper containing methylene chloride (F002). This waste is comparable to current waste stream identified as CRXCCLF101 in Attachment 5.

- Incinerator brick and residue generated by the incineration of F003 and F005 wastes. Analysis performed on samples of this material in 1988 for the purpose of evaluating this waste regarding Land Disposal Restrictions did not include analysis for PCBs. The analysis that was performed is included as Attachment 6. Waste streams that were input to this incinerator did not contain PCBs. Current wastes, documented in Attachment 5, that are the same as those that were incinerated in this unit are: CRXSSLF101, CRXOCWF101, CRXODRF101, CRXODRF102.

- Waste acrylonitrile (U009). This waste stream is no longer generated in this form. Acrylonitrile is a raw material that has been used in a limited number of resin formulas and is still used for one product manufactured at the PPG Circleville facility.

- Waste toluene diisocyanate (U223). This waste is the same as current waste stream identified as CRXRMSP107 in Attachment 5.

In summary, changes in resin formulation over the years have resulted in some variance in the amount of solvent constituents or the structure of resin polymers in the process wastes generated. However, these were not significant changes and the waste streams characterized in Attachment 5 are consistent with the wastes which were stored in the areas to be closed.

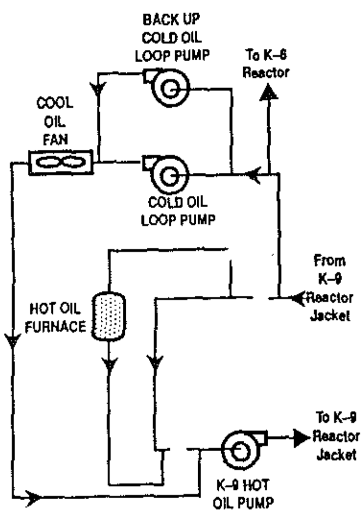
Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

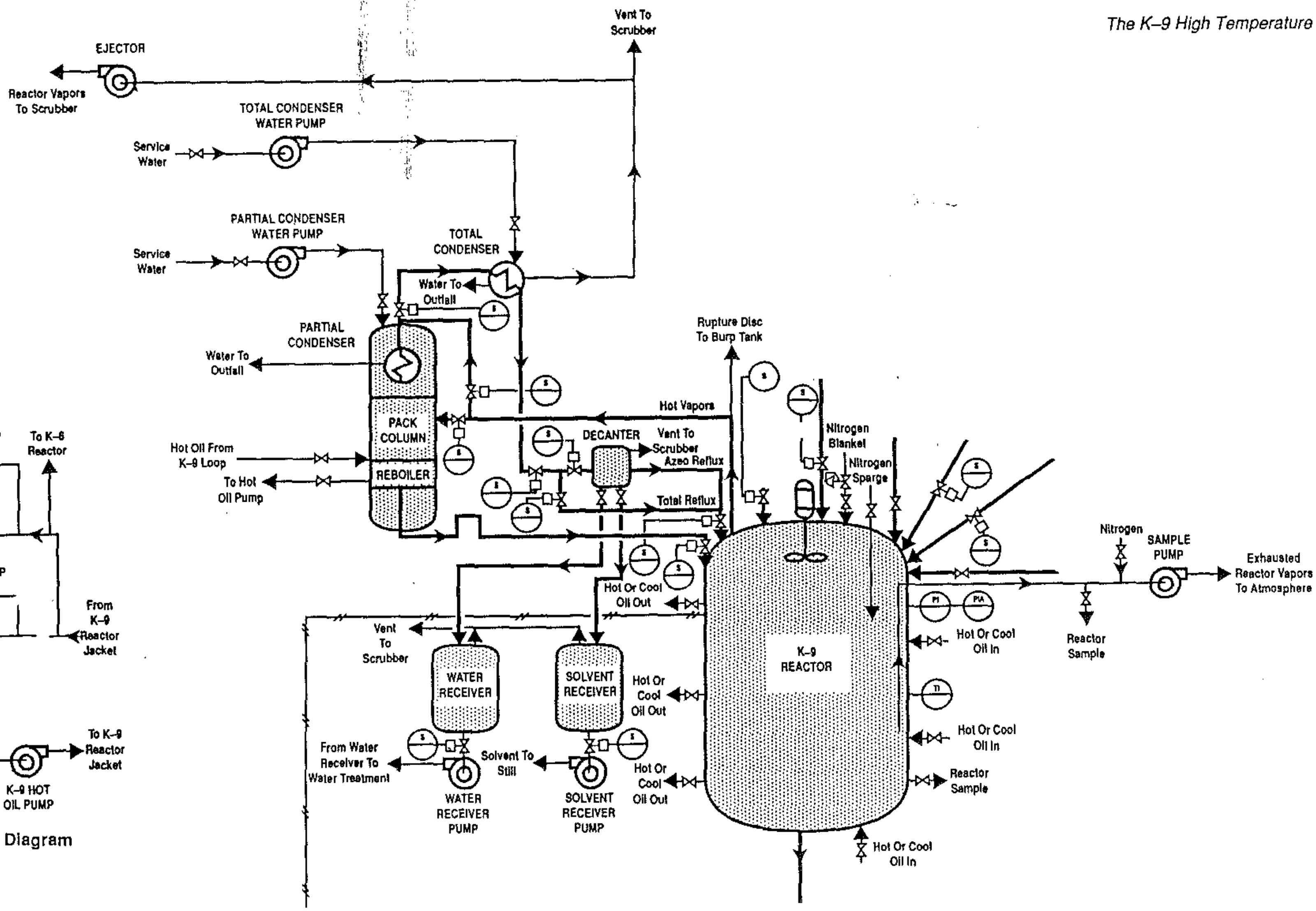
Lawrence [illegible] Date 4/13/92

ATTACHMENT 1

The K–9 High Temperature Reactor System



Heating And Cooling Flow Diagram



Reacting Flows And Controls

ATTACHMENT 2

NUS CORPORATION

Laboratory Services Division
5350 Campbells Run Road
Pittsburgh, PA 15205

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275
412-788-1080

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: P.O.BOX 457
CIRCLEVILLE, OH 43113

NUS PROJECT NO: 7028PD
NUS CLIENT NO: 320228
NUS SAMPLE NO: 14030757

REPORT DATE: 04/16/84

ATTENTION: DAVE WEIBEL

DATE RECEIVED: 03/19/84

SAMPLE IDENTIFICATION: OFF-SPEE RESIN COMPOSITE 03/12

TEST	DETERMINATION	RESULTS	UNITS
S015	% Ash @ 550 C	0.1	%
S040	British Thermal Units	15000	BTU/lb
S090	Flash Point (Pensky-Marten)	85	F
S165	% Solids, total at 103 C	38.1	%
S168	Specific Weight	7.9	lb/gal
S210	Viscosity	55	CP
S450	Lead (Pb)	25	mg/l
S950	Acid Digestion		

COM... S:

Reviewed and Approved by: JMC

ATTACHMENT 3

NUS CORPORATION

Laboratory Services Division
5350 Campbells Run Road
Pittsburgh, PA 15205

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

412-788-1080

STILL SLUDGE

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238

REPORT DATE: 01/11/87

ATTENTION: MR. DAVE MAZZOCCO

NUS CLIENT NO: 321909
NUS SAMPLE NO: 16110424
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 11/07/86

SAMPLE IDENTIFICATION: CV-86-0086-03

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.2	mg/l
M140	Chromium (Cr)	< 1	mg/l
M200	Lead (Pb)	8	mg/l
M250	Mercury (Hg)	0.0090	mg/l
OF01	Xylenes	240000	mg/l
OF05	2-butanone	< 40000	mg/l
OF08	4-methyl-2-pentanone	43000	mg/l
OF99	Volatile Organic Scan		
OM20	Ethyl Acetate	< 0.1	%
OM28	Methanol	< 0.1	%
OM48	Maleic Anhydride	< 1.0	%
OM57	n-Butanol	< 0.1	%
OM58	i-Butanol	< 0.1	%
OM64	Methyl Amyl Ketone	< 0.1	%
OV06	Carbon Tetrachloride	< 20000	mg/l
OV19	Ethylbenzene	72000	mg/l
OV22	Methylene Chloride	< 20000	mg/l
OV25	Toluene	29000	mg/l
OV30	Trichlorofluoromethane	< 20000	mg/l
S015	% Ash @ 550 C	< 1	%
S040	British Thermal Units	17000	BTU/lb
S064	Chlorine, Organic	< 0.1	%
S098	Fluorine, Organic	< 0.01	%
S195	% Water (Karl Fisher)	0.07	%
S950	Acid Digestion		
S971	Ashing		
S980	Oxygen Bomb Preparation		
W032	Ammonia as N (distillation)	44	mg/l
W435	Nitrogen, Kjeldahl (N)	180	mg/l
W440	Nitrogen, Organic (N)	~~140~~	mg/l
W620	Solids, total at 103 C	138000 13.8%	mg/l
W765	Total Sulfur-Gravimetric(S)	33	mg/l

TBOT KAL

COMMENTS:

TEntatively Identified Compound	Estimated Result	
Acetic Acid, Butyl Ester	35,000	mg/l

1-13-87
JAJ

JAN 16 1987
ENVIRONMENTAL ENGINEERING & CONTROL DEPARTMENT

Reviewed and Approved by: JMC

A Halliburton Company

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Division
5350 Campbells Run Road
Pittsburgh, PA 15205

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

412-788-1080

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238

REPORT DATE: 07/23/86

ATTENTION: MS. CHRIS BABKA

NUS CLIENT NO: 321909
NUS SAMPLE NO: 16051372
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 05/28/86

SAMPLE IDENTIFICATION: CV-86-0043-03 - Solvent Recovery Still Sludge

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.02	mg/l
M200	Lead (Pb)	1.9	mg/l
M250	Mercury (Hg)	< 0.02	mg/l
OM03	Carbon Tetrachloride	< 3.0	%
OM04	Toluene	< 0.1	%
OM05	Xylenes	< 0.1	%
OM06	Heptanes	2.5	%
OM10	Ethylbenzene	< 0.4	%
OM23	Methyl Ethyl Ketone	< 0.5	%
OM24	Methyl Isobutyl Ketone	11	%
OM32	Butyl Cellosolve	3.9	%
OM44	Methylene Chloride	< 0.1	%
OM48	Maleic Anhydride	< 0.1	%
OM57	n-Butanol	1.3	%
OM64	Methyl Amyl Ketone	< 0.1	%
OM65	Petroleum Ether	< 0.1	%
OM71	Trichlorofluoromethane	< 0.4	%
S015	% Ash @ 550 C	< 0.1	%
S040	British Thermal Units	19000	BTU/lb
S064	Chlorine, Organic	< 0.1	%
S098	Fluorine, Organic	< 0.01	%
S195	% Water (Karl Fisher)	2.4	%
S950	Acid Digestion		
S971	Ashing		
S980	Oxygen Bomb Preparation		
W032	Ammonia as N (distillation)	53	mg/l
W435	Nitrogen, Kjeldahl (N)	330	mg/l
W440	Nitrogen, Organic (N)	270	mg/l
W620	Solids, total at 103 C	168000 (16.8%)	mg/l

COMMENTS:

RECEIVED
JUL 25 1986
ENVIRONMENTAL ENGINEERING
& CONTROL DEPARTMENT

Reviewed and Approved by: JMC

A Halliburton Company

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Division
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

14

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
REPORT DATE: 01/11/87
ATTENTION: MR. DAVE MAZZOCCO

NUS CLIENT NO: 321909
NUS SAMPLE NO: 16110421
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 11/07/86

MR+RD WASTE S/7

SAMPLE IDENTIFICATION: CV-86-0083-03

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.2	mg/l
M140	Chromium (Cr)	< 1	mg/l
M200	Lead (Pb)	13	mg/l
M250	Mercury (Hg)	0.005	mg/l
OF01	Xylenes	8.5	%
OF05	2-butanone	< 8	%
OF08	4-methyl-2-pentanone	19	%
OF99	Volatile Organic Scan		
OM20	Ethyl Acetate	< 0.1	%
OM28	Methanol	< 0.1	%
OM48	Maleic Anhydride	< 1.0	%
OM57	n-Butanol	< 0.1	%
OM58	i-Butanol	0.4	%
OM64	Methyl Amyl Ketone	< 0.1	%
OV06	Carbon Tetrachloride	< 4	%
OV19	Ethylbenzene	2.6	%
OV22	Methylene Chloride	< 4	%
OV25	Toluene	1.5	%
ELIMINATE OV30	~~Trichlorofluoromethane~~	< 4	%
S015	% Ash @ 550 C	< 1	%
S040	British Thermal Units	16000	BTU/lb
S064	Chlorine, Organic	< 0.1	%
S098	Fluorine, Organic	< 0.01	%
S195	% Water (Karl Fisher)	2.1	%
S950	Acid Digestion		
S971	Ashing		
S980	Oxygen Bomb Preparation		
W032	Ammonia as N (distillation)	44	mg/l
W435	Nitrogen, Kjeldahl (N)	190	mg/l
W440	Nitrogen, Organic (N)	96	mg/l
W620	Solids, total at 103 C	146000	mg/l
W765	Total Sulfur-Gravimetric(S)	< 1	mg/l

POC ER

JAN 1987 RECEIVED

RECEIVED JAN 16 1987 ENVIRONMENTAL ENGINEERING & CONTROL DEPARTMENT

COMMENTS: NO ADDITIONAL VOLATILE ORGANICS > 1% WERE DETECTED.

Reviewed and Approved by: JMC

A Halliburton Company

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Division
5350 Campbells Run Road
Pittsburgh, PA 15205

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

412-788-1080

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238

NUS CLIENT NO: 321909
NUS SAMPLE NO: 16110423
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 11/07/86

REPORT DATE: 01/11/87

ATTENTION: MR. DAVE MAZZOCCO

SELECTRON

SAMPLE IDENTIFICATION: CV-86-0085-03

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.2	mg/l
M140	Chromium (Cr)	< 1	mg/l
M200	Lead (Pb)	< 3	mg/l
M250	Mercury (Hg)	< 0.004	mg/l
OF01	Xylenes	110	mg/l
OF05	2-butanone	1600	mg/l
OF08	4-methyl-2-pentanone	1200	mg/l
OF99	Volatile Organic Scan		
OM20	Ethyl Acetate	< 0.1	%
OM2C	Methanol	0.1	%
OM48	Maleic Anhydride	< 1.0	%
OM57	n-Butanol	< 0.1	%
OM58	i-Butanol	0.34	%
OM64	Methyl Amyl Ketone	< 0.1	%
OV06	Carbon Tetrachloride	< 40	mg/l
OV19	Ethylbenzene	< 40	mg/l
OV22	Methylene Chloride	< 40	mg/l
OV25	Toluene	64	mg/l
OV30	Trichlorofluoromethane	< 40	mg/l
S015	% Ash @ 550 C	< 1	%
S040	British Thermal Units	WNC	
S064	Chlorine, Organic	< 0.1	%
S098	Fluorine, Organic	< 0.01	%
S195	% Water (Karl Fisher)	72	%
S950	Acid Digestion		
S971	Ashing		
S980	Oxygen Bomb Preparation		
W032	Ammonia as N (distillation)	1200	mg/l
W435	Nitrogen, Kjeldahl (N)	1400	mg/l
W440	Nitrogen, Organic (N)	100	mg/l
W620	Solids, total at 103 C	88300	mg/l
W765	Total Sulfur-Gravimetric(S)	< 1	mg/l

RECEIVED JAN 16 1987 ENVIRONMENTAL ENGINEERING & CONTROL DEPARTMENT

COMMENTS: NO VOLATILE ORGANICS > 1% WERE DETECTED. WNC INDICATES THE SAMPLE WILL NOT COMBUST.

Reviewed and Approved by: JMC

A Halliburton Company

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Division
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
REPORT DATE: 07/23/86
ATTENTION: MS. CHRIS BABKA

NUS CLIENT NO: 321909
NUS SAMPLE NO: 16051371
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 05/28/86

SAMPLE IDENTIFICATION: CV-86-0042-03 - Alkyd S/T Waste

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.02	mg/l
M200	Lead (Pb)	3.5	mg/l
M250	Mercury (Hg)	< 0.02	mg/l
OM03	Carbon Tetrachloride	< 0.3	%
OM04	Toluene	< 0.1	%
OM05	Xylenes	1.4	%
OM06	Heptanes	< 0.1	%
OM10	Ethylbenzene	< 0.4	%
OM23	Methyl Ethyl Ketone	< 0.1	%
OM24	Methyl Isobutyl Ketone	21	%
OM32	Butyl Cellosolve	15	%
OM44	Methylene Chloride	< 0.1	%
OM48	Maleic Anhydride	< 0.1	%
OM57	n-Butanol	0.1	%
OM64	Methyl Amyl Ketone	< 0.1	%
OM65	Petroleum Ether	< 0.1	%
OM71	Trichlorofluoromethane	< 0.4	%
S015	% Ash @ 550 C	< 0.1	%
S040	British Thermal Units	9000	BTU/lb
S064	Chlorine, Organic	< 0.1	%
S098	Fluorine, Organic	< 0.01	%
S195	% Water (Karl Fisher)	40.1 ?	%
S950	Acid Digestion		
S971	Ashing		
S980	Oxygen Bomb Preparation		
W032	Ammonia as N (distillation)	28	mg/l
W435	Nitrogen, Kjeldahl (N)	740	mg/l
W440	Nitrogen, Organic (N)	720	mg/l
W620	Solids, total at 103 C	133000	mg/l

COMMENTS:

RECEIVED
JUL 25 1986
ENVIRONMENTAL ENGINEERING
& CONTROL DEPARTMENT

Reviewed and Approved by: JMC

A Halliburton Company

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Division
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
REPORT DATE: 07/23/86
ATTENTION: MS. CHRIS BABKA

NUS CLIENT NO: 321909
NUS SAMPLE NO: 16051370
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 05/28/86

SAMPLE IDENTIFICATION: CV-86-0041-03 - Selectron Waste S/T

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.02	mg/l
M200	Lead (Pb)	3.1	mg/l
M250	Mercury (Hg)	0.03	mg/l
OM03	Carbon Tetrachloride	< 3.0	%
OM04	Toluene	< 0.1	%
OM05	Xylenes	< 0.3	%
OM06	Heptanes	2.3	%
OM10	Ethylbenzene	< 0.7	%
OM23	Methyl Ethyl Ketone	1.0	%
OM24	Methyl Isobutyl Ketone	6.7	%
OM32	Butyl Cellosolve	5.8	%
OM44	Methylene Chloride	0.10	%
OM48	Maleic Anhydride	< 0.1	%
OM57	n-Butanol	1.6	%
OM64	Methyl Amyl Ketone	< 0.1	%
OM65	Petroleum Ether	< 0.1	%
OM71	Trichlorofluoromethane	< 0.4	%
S015	% Ash @ 550 C	< 0.1	%
S040	British Thermal Units	15000	BTU/lb
S064	Chlorine, Organic	0.16	%
S098	Fluorine, Organic	< 0.01	%
S195	% Water (Karl Fisher)	1.8	%
S950	Acid Digestion		
S971	Ashing		
S980	Oxygen Bomb Preparation		
W032	Ammonia as N (distillation)	56	mg/l
W435	Nitrogen, Kjeldahl (N)	360	mg/l
W440	Nitrogen, Organic (N)	300	mg/l
W620	Solids, total at 103 C	277000	mg/l

COMMENTS:

RECEIVED
JUL 25 1986
ENVIRONMENTAL ENGINEERING
& CONTROL DEPARTMENT

Reviewed and Approved by: JMC

A Halliburton Company

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Division
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
REPORT DATE: 07/23/86
ATTENTION: MS. CHRIS BABKA

NUS CLIENT NO: 321909
NUS SAMPLE NO: 16051369
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 05/28/86

SAMPLE IDENTIFICATION: CV-86-0040-03 - MR & RD Waste Storage Samples

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.02	mg/l
M200	Lead (Pb)	2.2	mg/l
M250	Mercury (Hg)	0.05	mg/l
OM03	Carbon Tetrachloride	< 3.0	%
OM04	Toluene	< 0.1	%
OM05	Xylenes	< 0.1	%
OM06	Heptanes	2.8	%
OM10	Ethylbenzene	< 0.1	%
OM23	Methyl Ethyl Ketone	1.3	%
OM24	Methyl Isobutyl Ketone	3.4	%
OM32	Butyl Cellosolve	1.8	%
OM44	Methylene Chloride	0.19	%
OM48	Maleic Anhydride	< 0.1	%
OM57	n-Butanol	1.0	%
OM64	Methyl Amyl Ketone	< 0.1	%
OM65	Petroleum Ether	< 0.1	%
OM71	Trichlorofluoromethane	< 0.4	%
S015	% Ash @ 550 C	< 0.1	%
S040	British Thermal Units	15000	BTU/lb
S064	Chlorine, Organic	0.46	%
S195	% Water (Karl Fisher)	3.61	%
S950	Acid Digestion		
S971	Ashing		
S980	Oxygen Bomb Preparation		
W032	Ammonia as N (distillation)	45	mg/l
W435	Nitrogen, Kjeldahl (N)	360	mg/l
W440	Nitrogen, Organic (N)	320	mg/l
W620	Solids, total at 103 C	393000	mg/l

RECEIVED
JUL 25 1986
ENVIRONMENTAL ENGINEERING & CONTROL DEPARTMENT

COMMENTS:

Reviewed and Approved by: JMC

A Halliburton Company

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Division
5350 Campbells Run Road
Pittsburgh, PA 15205

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

412-788-1080

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC. NUS CLIENT NO: 321909
ADDRESS: 260 KAPPA DRIVE NUS SAMPLE NO: 16051374
PITTSBURGH, PA 15238 VENDOR NO: 01831710
REPORT DATE: 07/23/86 WORK ORDER NO: 55830
ATTENTION: MS. CHRIS BABKA DATE RECEIVED: 05/28/86

SAMPLE IDENTIFICATION: CV-86-0048-03 - WPS-18384 (ACRYLIC RESIN, HEPTANE SOLVENT)

TEST	DETERMINATION	RESULTS	UNITS
S015	% Ash @ 550 C	< 0.1	%
S064	Chlorine, Organic	< 0.1	%
S980	Oxygen Bomb Preparation		

RECEIVED
JUL 25 1986
ENVIRONMENTAL ENGINEERING
& CONTROL DEPARTMENT

COMMENTS:

Reviewed and Approved by: JMC

NUS CORPORATION

Laboratory Services Division
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
REPORT DATE: 07/23/86
ATTENTION: MS. CHRIS BABKA

NUS CLIENT NO: 321909
NUS SAMPLE NO: 16051372
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 05/28/86

SAMPLE IDENTIFICATION: CV-86-0043-03 - Solvent Recovery Still Sludge

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.02	mg/l
M200	Lead (Pb)	1.9	mg/l
M250	Mercury (Hg)	< 0.02	mg/l
OM03	Carbon Tetrachloride	< 3.0	%
OM04	Toluene	< 0.1	%
OM05	Xylenes	< 0.1	%
OM06	Heptanes	2.5	%
OM10	Ethylbenzene	< 0.4	%
OM23	Methyl Ethyl Ketone	< 0.5	%
OM24	Methyl Isobutyl Ketone	11	%
OM32	Butyl Cellosolve	3.9	%
OM44	Methylene Chloride	< 0.1	%
OM48	Maleic Anhydride	< 0.1	%
OM57	n-Butanol	1.3	%
OM64	Methyl Amyl Ketone	< 0.1	%
OM65	Petroleum Ether	< 0.1	%
OM71	Trichlorofluoromethane	< 0.4	%
S015	% Ash @ 550 C	< 0.1	%
S040	British Thermal Units	19000	BTU/lb
S064	Chlorine, Organic	< 0.1	%
S098	Fluorine, Organic	< 0.01	%
S195	% Water (Karl Fisher)	2.4	%
S950	Acid Digestion		
S971	Ashing		
S980	Oxygen Bomb Preparation		
W032	Ammonia as N (distillation)	53	mg/l
W435	Nitrogen, Kjeldahl (N)	330	mg/l
W440	Nitrogen, Organic (N)	270	mg/l
W620	Solids, total at 103 C	168000	mg/l

RECEIVED
JUL 25 1986
ENVIRONMENTAL ENGINEERING
& CONTROL DEPARTMENT

COMMENTS:

Reviewed and Approved by: JMC

NUS CORPORATION

Laboratory Services Division
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

4 7

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
REPORT DATE: 07/23/86
ATTENTION: MS. CHRIS BABKA

NUS CLIENT NO: 321909
NUS SAMPLE NO: 16051375
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 05/28/86

SAMPLE IDENTIFICATION: CV-86-0049-03 - 75-10 Floor Stripper - Used

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.02	mg/l
M200	Lead (Pb)	3.3	mg/l
M250	Mercury (Hg)	0.11	mg/l
OF01	Xylenes	2.7	%
OF05	2-butanone	< 0.8	%
OF08	4-methyl-2-pentanone	3.3	%
OM29	Ethanol	3.5	%
OM32	Butyl Cellosolve	0.86	%
OV19	Ethylbenzene	0.7	%
OV22	Methylene Chloride	15	%
OV25	Toluene	0.7	%
OV91	Volatile Organic Scan		
S015	% Ash @ 550 C	1.0	%
S040	British Thermal Units	8200	BTU/lb
S064	Chlorine, Organic	10	%
S195	% Water (Karl Fisher)	23.2	%
S950	Acid Digestion		
S971	Ashing		
S980	Oxygen Bomb Preparation		
W620	Solids, total at 103 C	205000	mg/l

RECEIVED
JUL 25 1986
ENVIRONMENTAL ENGINEERING
& CONTROL DEPARTMENT

COMMENTS: NO ADDITIONAL VOLATILE ORGANICS > 1% WERE DETECTED.

Reviewed and Approved by: JMC

NUS CORPORATION

Laboratory Services Division
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238

NUS CLIENT NO: 321909
NUS SAMPLE NO: 16110422
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 11/07/86

REPORT DATE: 01/11/87

ATTENTION: MR. DAVE MAZZOCCO

ALKYD WASTE S/T

SAMPLE IDENTIFICATION: CV-86-0084-03

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.2	mg/l
M140	Chromium (Cr)	< 1	mg/l
M200	Lead (Pb)	< 3	mg/l
M250	Mercury (Hg)	0.032	mg/l
OF01	Xylenes	94000	mg/l
OF05	2-butanone	< 40000	mg/l
OF08	4-methyl-2-pentanone	170000	mg/l
OF99	Volatile Organic Scan		
OM20	Ethyl Acetate	< 0.1	%
OM28	Methanol	0.1	%
OM48	Maleic Anhydride	< 1.0	%
OM57	n-Butanol	< 0.1	%
OM58	i-Butanol	< 0.1	%
OM64	Methyl Amyl Ketone	< 0.1	%
OV06	Carbon Tetrachloride	< 20000	mg/l
OV19	Ethylbenzene	30000	mg/l
OV22	Methylene Chloride	< 20000	mg/l
OV25	Toluene	23000	mg/l
OV30	Trichlorofluoromethane	< 20000	mg/l
S015	% Ash @ 550 C	< 1	%
S040	British Thermal Units	16000	BTU/lb
S064	Chlorine, Organic	0.3	%
S098	Fluorine, Organic	0.03	%
S195	% Water (Karl Fisher)	1.9	%
S950	Acid Digestion		
S971	Ashing		
S980	Oxygen Bomb Preparation		
W032	Ammonia as N (distillation)	93	mg/l
W435	Nitrogen, Kjeldahl (N)	310	mg/l
W440	Nitrogen, Organic (N)	220	mg/l
W620	Solids, total at 103 C	112000	mg/l
W765	Total Sulfur-Gravimetric(S)	2.7	mg/l

COMMENTS: NO ADDITIONAL VOLATILE ORGANICS > 1% WERE DETECTED.

JAN 16 1987
ENVIRONMENTAL ENGINEERING & CONTROL DEPARTMENT

Reviewed and Approved by: JMC

NUS CORPORATION

Laboratory Services Group
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

SPENT FLOOR STRIPPER, COMBINATION OF SAMPLES FROM 5 DRUMS SELECTED AT RANDOM. LOWER PHASE

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238

REPORT DATE: 07/13/87

ATTENTION: MR. DAVE MAZZOCCO

NUS CLIENT NO: 321909
NUS SAMPLE NO: 17051366
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 05/27/87

SAMPLE IDENTIFICATION: CV-87-0189-03 LOWER PHASE 05/11

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.05	mg/l
M200	Lead (Pb)	1.6	mg/l
M250	Mercury (Hg)	0.050	mg/l
OF01	Xylenes	< 20000	mg/l
OF05	2-Butanone(MEK)	67000	mg/l
OF08	4-Methyl-2-Pentanone(MIBK)	< 40000	mg/l
OF09	Styrene	< 20000	mg/l
OF99	Volatile Organic Scan		
OM07	2-Butoxy ethanol	1.3	%
OM12	Kerosene	< 0.1	%
OM29	Ethanol	1.6	%
OM32	Butyl Cellosolve	1.1	%
OM36	Mineral spirits	< 0.1	%
OM51	Ethylene Glycol	< 0.1	%
OM61	Butyl Acetate	0.35	%
OM64	Methyl Amyl Ketone	< 0.1	%
OO22	Naptha	< 0.2	%
OO23	Heptane	< 0.1	%
OV22	Methylene Chloride	450000	mg/l
OV25	Toluene	< 20000	mg/l
OV27	1,1,1-Trichloroethane	< 20000	mg/l
OV28	1,1,2-Trichloroethane	< 20000	mg/l
S015	% Ash at 550 C	0.1	%
S040	British Thermal Units	9610	BTU/lb
S064	Chlorine, Organic	30	%
S090	Flash Point (Pensky-Marten)	80	F
S098	Fluorine, Organic	< 0.01	%
S168	Specific Weight	9.2	lb/gal
S195	% Water (Karl Fisher)	2.2	%
S210	Viscosity	20	CP
S980	Oxygen Bomb Preparation		
W315	Halogens, Total Organic (TOX)	INT	

RECEIVED
JUL 14 1987
ENVIRONMENTAL ENGINE...

RECEIVED JUL 1987

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Group
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

SPENT FLOOR STRIPPER, COMBINATION OF
SAMPLES FROM 5 DRUMS SELECTED AT RANDOM.
LOWER PHASE

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
ATTENTION: MR. DAVE MAZZOCCO

REPORT DATE: 07/13/87

NUS CLIENT NO: 321909
NUS SAMPLE NO: 17051366
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 05/27/87

SAMPLE IDENTIFICATION: CV-87-0189-03 LOWER PHASE 05/11

TEST	DETERMINATION	RESULTS	UNITS
W620	Solids, Total at 103 C	210000	mg/l
	Toluene	9800	mg/l
	Ethylbenzene	< 20000	mg/l

CAK 7/13/87

JUL 1987 RECEIVED

RECEIVED JUL 14 1987 ENVIRON...

COMMENTS: Sample contained gasoline at concentration of 8.9%. INT for TOX; Sample is not soluble in water.

Reviewed and Approved by: JMC

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Group
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

SPENT FLOOR STRIPPER, COMBINATION OF SAMPLES FROM 5 DRUMS SELECTED AT RANDOM. UPPER PHASE

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238

REPORT DATE: 07/13/87

ATTENTION: MR. DAVE MAZZOCCO

NUS CLIENT NO: 321909
NUS SAMPLE NO: 17051365
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 05/27/87

SAMPLE IDENTIFICATION: CV-87-0189-03 UPPER PHASE 05/11

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.05	mg/l
M200	Lead (Pb)	1.3	mg/l
M250	Mercury (Hg)	< 0.004	mg/l
OF01	Xylenes	< 400	mg/l
OF05	2-Butanone(MEK)	8200	mg/l
OF08	4-Methyl-2-Pentanone(MIBK)	< 800	mg/l
OF09	Styrene	< 400	mg/l
OF99	Volatile Organic Scan		
OM07	2-Butoxy ethanol	0.21	%
OM12	Kerosene	< 0.1	%
OM29	Ethanol	3.6	%
OM32	Butyl Cellosolve	0.13	%
OM36	Mineral spirits	< 0.1	%
OM51	Ethylene Glycol	< 0.1	%
OM61	Butyl Acetate	< 0.1	%
OM64	Methyl Amyl Ketone	< 0.1	%
OO22	Naptha	< 0.2	%
OO23	Heptane	< 0.1	%
OV22	Methylene Chloride	9000	mg/l
OV25	Toluene	< 400	mg/l
OV27	1,1,1-Trichloroethane	< 400	mg/l
OV28	1,1,2-Trichloroethane	< 400	mg/l
S015	% Ash at 550 C	1.4	%
S040	British Thermal Units	1800	BTU/lb
S064	Chlorine, Organic	0.10	%
S090	Flash Point (Pensky-Marten)	< /= 70	F
S098	Fluorine, Organic	< 0.01	%
S168	Specific Weight	8.4	lb/gal
S195	% Water (Karl Fisher)	62	%
S210	Viscosity	12	CP
S980	Oxygen Bomb Preparation		
W315	Halogens, Total Organic (TOX)	17000	ug/l

RECEIVED
JUL 14 1987
ENVIRONMENTAL ENGINEERING

RECEIVED
JUL 1987

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Group
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

SPENT FLOOR STRIPPER, COMBINATION OF SAMPLES FROM 5 DRUMS SELECTED AT RANDOM.
UPPER PHASE

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
ATTENTION: MR. DAVE MAZZOCCO

REPORT DATE: 07/13/87

NUS CLIENT NO: 321909
NUS SAMPLE NO: 17051365
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 05/27/87

SAMPLE IDENTIFICATION: CV-87-0189-03 UPPER PHASE 05/11

TEST	DETERMINATION	RESULTS	UNITS
W620	Solids, Total at 103 C	28100	mg/l
	Acetone	1200	mg/l
	Ethylbenzene	< 400	mg/l
	Toluene	140	mg/l

CAK
7/13/87

JUL 1987
RECEIVED

COMMENTS:

RECEIVED
JUL 14 1987

Reviewed and Approved by: JMC

CLIENT ORIGINAL

ATTACHMENT 4

NUS CORPORATION

Laboratory Services Group
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

CATIONIC WASTE RESIN

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238

NUS CLIENT NO: 321909
NUS SAMPLE NO: 17072328
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 07/30/87

REPORT DATE: 08/20/87

ATTENTION: MR. DAVE MAZZOCCO

SAMPLE IDENTIFICATION: CV-87-0207-03 07/21

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.05	mg/l
M140	Chromium (Cr)	< 0.1	mg/l
M200	Lead (Pb)	< 0.3	mg/l
M250	Mercury (Hg)	< 0.004	mg/l
M270	Nickel (Ni)	< 0.3	mg/l
M330	Thallium (Tl)	< 1	mg/l
OF01	Xylenes	1100	mg/l
OF05	2-Butanone(MEK)	6300	mg/l
OF08	4-Methyl-2-Pentanone(MIBK)	3900	mg/l
OF99	Volatile Organic Scan		
OM20	Ethyl Acetate	< 1.0	ug/l
OM28	Methanol	0.16	%
OM48	Maleic Anhydride	< 0.5	%
OM57	n-Butanol	1.2	%
OM58	i-Butanol	< 0.2	%
OM64	Methyl Amyl Ketone	< 0.1	%
OP80	Total PCBs	39	mg/kg 1242 ←
OV19	Ethylbenzene	220	mg/l
OV22	Methylene Chloride	6400	mg/l
OV25	Toluene	< 200	mg/l
S015	% Ash at 550 C	0.1	%
S040	British Thermal Units	WNC	
S064	Chlorine, Organic	0.08	%
S098	Fluorine, Organic	< 0.01	%
S195	% Water (Karl Fisher)	60	%
S980	Oxygen Bomb Preparation		
W032	Ammonia - Distillation (as N)	6.5	mg/l
W435	Nitrogen, Kjeldahl (N)	240	mg/l
W440	Nitrogen, Organic (N)	230	mg/l
W765	Total Sulfur (S)-gravimetric	INT	

COMMENTS: NO ADDITIONAL VOLATILE COMPOUNDS WERE IDENTIFIED.

RECEIVED
AUG 20 1987

Reviewed and Approved by: JCS

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Group
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

SPEC-CATIONIC CLEANUP

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
REPORT DATE: 08/20/87
ATTENTION: MR. DAVE MAZZOCCO

NUS CLIENT NO: 321909
NUS SAMPLE NO: 17072327
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 07/30/87

SAMPLE IDENTIFICATION: CV-87-0206-03 07/21

TEST	DETERMINATION	RESULTS	UNITS
M270	RCRA METALS		
M030	Arsenic (As)	< 0.01	mg/l
M040	Barium (Ba)	< 1	mg/l
M090	Cadmium (Cd)	< 0.05	mg/l
M140	Chromium (Cr)	< 0.1	mg/l
M200	Lead (Pb)	< 0.3	mg/l
M250	Mercury (Hg)	0.01	mg/l
M290	Selenium (Se)	< 0.04	mg/l
M300	Silver (Ag)	< 0.1	mg/l
M270	Nickel (Ni)	< 0.3	mg/l
M330	Thallium (Tl)	< 1	mg/l
OF01	Xylenes	180000	mg/l
OF05	2-Butanone(MEK)	< 4000	mg/l
OF08	4-Methyl-2-Pentanone(MIBK)	130000	mg/l
OM32	Butyl Cellosolve	50	%
OM64	Methyl Amyl Ketone	< 2.0	%
OP80	Total PCBs	< 10	mg/kg
OV06	Carbon Tetrachloride	< 2000	mg/l
OV19	Ethylbenzene	35000	mg/l
OV22	Methylene Chloride	< 2000	mg/l
OV25	Toluene	< 2000	mg/l
OV30	Trichlorofluoromethane	< 2000	mg/l
OV91	Volatile Organic Analysis		
S015	% Ash at 550 C	< 0.1	%
S040	British Thermal Units	12200	BTU/lb
S064	Chlorine, Organic	< 0.01	%
S098	Fluorine, Organic	< 0.01	%
S195	% Water (Karl Fisher)	0.4	%
S980	Oxygen Bomb Preparation		
W032	Ammonia - Distillation (as N)	1.4	mg/l
W435	Nitrogen, Kjeldahl (N)	370	mg/l
W440	Nitrogen, Organic (N)	370	mg/l

AUG 20 1987

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Group
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

CATIONIC FLUSHWATER

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
ATTENTION: MR. DAVE MAZZOCCO

REPORT DATE: 06/04/87

NUS CLIENT NO: 321909
NUS SAMPLE NO: 17041489
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 04/24/87

SAMPLE IDENTIFICATION: CV-87-0172-03

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.05	mg/l
M140	Chromium (Cr)	< 0.1	mg/l
M200	Lead (Pb)	2.6	mg/l
M250	Mercury (Hg)	< 0.004	mg/l
OF01	Xylenes	66	mg/l
OF08	4-Methyl-2-Pentanone(MIBK)	1200	mg/l
OF99	Volatile Organic Scan		
OM32	Butyl Cellosolve	< 0.1	%
OM57	n-Butanol	< 0.1	%
OM58	i-Butanol	< 0.1	%
OM59	t-Butanol	< 0.1	%
OP80	Total PCBs	< 10	mg/kg
OV06	Carbon Tetrachloride	< 67	mg/l
OV22	Methylene Chloride	1700	mg/l
OV25	Toluene	< 67	mg/l
OV30	Trichlorofluoromethane	< 67	mg/l
S015	% Ash at 550 C	< 0.1	%
S040	British Thermal Units	WNC	
S064	Chlorine, Organic	< 0.1	%
S090	Flash Point (Pensky-Marten)	> 140	F
S098	Fluorine, Organic	< 0.01	%
S195	% Water (Karl Fisher)	56	%
S950	Acid Digestion		
S971	Ashing		
S980	Oxygen Bomb Preparation		
W032	Ammonia - Distillation (as N)	< 10	mg/l
W050	BOD, 5-day (O2)	12000	mg/l
W116	Organic Carbon(non-purgeable)	13500	mg/l
W435	Nitrogen, Kjeldahl (N)	100	mg/l
W440	Nitrogen, Organic (N)	100	mg/l
W590	Solids, Dissolved at 180 C	5280	mg/l
W610	Solids, Suspended at 103 C	380	mg/l

RECEIVED
JUN 1? 1987

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Group
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

COMPOSITE OF DIRTY SOLVENT-SOUTH TANK (UPPER LAYER)

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
REPORT DATE: 06/18/87
ATTENTION: MR. DAVE MAZZOCCO

NUS CLIENT NO: 321909
NUS SAMPLE NO: 17041616
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 04/28/87

SAMPLE IDENTIFICATION: CV-87-0182-03 UPPER LAYER 04/24

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.05	mg/l
M140	Chromium (Cr)	0.1	mg/l
M200	Lead (Pb)	< 0.3	mg/l
M250	Mercury (Hg)	0.04	mg/l
0F01	Xylenes	360000	mg/l (36%)
0F05	2-Butanone(MEK)	< 16000	mg/l
0F08	4-Methyl-2-Pentanone(MIBK)	120000	mg/l (12%)
0F99	Volatile Organic Scan		
0M32	Butyl Cellosolve	3.8	%
0M50	Petroleum naphtha	< 1.0	%
0M57	n-Butanol	1.5	%
0M58	i-Butanol	0.4	%
0M59	t-Butanol	< 0.1	%
0M64	Methyl Amyl Ketone	< 1	%
0P80	Total PCBs	< 10	mg/kg
0V06	Carbon Tetrachloride	< 8000	mg/l
0V22	Methylene Chloride	< 8000	mg/l
0V25	Toluene	88000	mg/l (8.8%)
0V30	Trichlorofluoromethane	< 8000	mg/l
S015	% Ash at 550 C	< 0.1	%
S040	British Thermal Units	16900	BTU/lb
S064	Chlorine, Organic	< 0.1	%
S090	Flash Point (Pensky-Marten)	</= 70	F
S098	Fluorine, Organic	0.02	%
S168	Specific Weight	6.9	lb/gal
S195	% Water (Karl Fisher)	0.2	%
S210	Viscosity	5	CP
S950	Acid Digestion		
S971	Ashing		
S980	Oxygen Bomb Preparation		
W032	Ammonia - Distillation (as N)	8	mg/l
W435	Nitrogen, Kjeldahl (N)	22	mg/l

RECEIVED JUN 19 1987 ENVIRONMENTAL

JUL 1987 RECEIVED

PAGE NO: 1

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Group
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

COMPOSITE OF DIRTY SOLVENT-NORTH TANK (UPPER LAYER)

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
REPORT DATE: 06/18/87
ATTENTION: MR. DAVE MAZZOCCO

NUS CLIENT NO: 321909
NUS SAMPLE NO: 17041618
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 04/28/87

SAMPLE IDENTIFICATION: CV-87-0183-03 UPPER LAYER 04/24

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.05	mg/l
M140	Chromium (Cr)	< 0.1	mg/l
M200	Lead (Pb)	< 0.3	mg/l
M250	Mercury (Hg)	0.008	mg/l
OF01	Xylenes	260000	mg/l 26%
OF05	2-Butanone(MEK)	< 8000	mg/l
OF08	4-Methyl-2-Pentanone(MIBK)	130000	mg/l 13%
OF99	Volatile Organic Scan		
OM32	Butyl Cellosolve	4.2	%
OM50	Petroleum naphtha	< 1.0	%
OM57	n-Butanol	1.5	%
OM58	i-Butanol	0.5	%
OM59	t-Butanol	< 0.1	%
OM64	Methyl Amyl Ketone	< 1.0	%
OP80	Total PCBs	< 10	mg/kg
OV06	Carbon Tetrachloride	< 4000	mg/l
OV22	Methylene Chloride	< 4000	mg/l
OV25	Toluene	69000	mg/l 6.9
OV30	Trichlorofluoromethane	< 4000	mg/l
S015	% Ash at 550 C	< 0.1	%
S040	British Thermal Units	17100	BTU/lb
S064	Chlorine, Organic	< 0.1	%
S090	Flash Point (Pensky-Marten)	< /= 70	F
S098	Fluorine, Organic	< 0.01	%
S168	Specific Weight	7.0	lb/gal
S195	% Water (Karl Fisher)	0.6	%
S210	Viscosity	5	CP
S950	Acid Digestion		
S971	Ashing		
S980	Oxygen Bomb Preparation		
W032	Ammonia - Distillation (as N)	11	mg/l
W435	Nitrogen, Kjeldahl (N)	300	mg/l

JUL 1987
RECEIVED

RECEIVED
JUN 19 1987
ENVIRONMENTAL ENGINEERING

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Group
5350 Campbells Run Road
Pittsburgh, PA 15205

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275
412-788-1080

FILTER CARTRIDGES NON-LITHARGE

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
REPORT DATE: 06/04/87
ATTENTION: MR. DAVE MAZZOCCO

NUS CLIENT NO: 321909
NUS SAMPLE NO: 17041492
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 04/24/87

SAMPLE IDENTIFICATION: CV-87-0175-03

TEST	DETERMINATION	RESULTS	UNITS
0143	TOTAL PCB'S IN SEDIMENT		
0E23	MLS Extraction		
0P81	Total PCBs - Soil	< 5	mg/kg
0F01	Xylenes	7100	mg/kg
0F05	2-Butanone(MEK)	< 200	mg/kg
0F08	4-Methyl-2-Pentanone(MIBK)	200	mg/kg
0F99	Volatile Organic Scan		
0M20	Ethyl Acetate	< 0.1	%
0M29	Ethanol	< 0.1	%
0M32	Butyl Cellosolve	1.2	%
0M64	Methyl Amyl Ketone	< 0.1	%
0N19	n-Propyl Acetate	< 0.1	%
0V06	Carbon Tetrachloride	< 100	mg/kg
0V22	Methylene Chloride	< 100	mg/kg
0V25	Toluene	620	mg/kg
0V30	Trichlorofluoromethane	< 100	mg/kg
S271	RCRA METALS - SOLID		
S400	Arsenic (As)	< 0.1	mg/kg
S410	Barium (Ba)	10	mg/kg
S420	Cadmium (Cd)	< 0.5	mg/kg
S430	Chromium (Cr)	1	mg/kg
S450	Lead (Pb)	14	mg/kg
S460	Mercury (Hg)	< 0.1	mg/kg
S490	Selenium (Se)	< 0.4	mg/kg
S500	Silver (Ag)	< 1	mg/kg
S950	Acid Digestion		
S010	Ammonia, Distillation (as N)	450	mg/kg
S015	% Ash at 550 C	2.9	%
S040	British Thermal Units	11900	BTU/lb
S064	Chlorine, Organic	< 0.1	%
S090	Flash Point (Pensky-Marten)	> 140	F
S098	Fluorine, Organic	< 0.01	%

RECEIVED
JUN 10 1987

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Group
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

CATIONIC DISTILLATE (MIBK)

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
REPORT DATE: 06/04/87
ATTENTION: MR. DAVE MAZZOCCO

NUS CLIENT NO: 321909
NUS SAMPLE NO: 17041490
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 04/24/87

SAMPLE IDENTIFICATION: CV-87-0173-03

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.05	mg/l
M140	Chromium (Cr)	< 0.1	mg/l
M200	Lead (Pb)	< 0.3	mg/l
M250	Mercury (Hg)	< 0.004	mg/l
OF01	Xylenes	< 16000	mg/l
OF08	4-Methyl-2-Pentanone(MIBK)	740000	mg/l 74%
OF99	Volatile Organic Scan		
OM10	Ethylbenzene	< 0.1	%
OM32	Butyl Cellosolve	< 0.1	%
OM57	n-Butanol	2.7	%
OM58	i-Butanol	< 0.1	%
OM59	t-Butanol	< 0.1	%
OP80	Total PCBs	< 10	mg/kg
OV06	Carbon Tetrachloride	< 16000	mg/l < 1.6%
OV22	Methylene Chloride	< 16000	mg/l
OV25	Toluene	< 16000	mg/l
OV30	Trichlorofluoromethane	< 16000	mg/l
S015	% Ash at 550 C	< 0.1	%
S040	British Thermal Units	15550	BTU/lb
S064	Chlorine, Organic	< 0.1	%
S090	Flash Point (Pensky-Marten)	< /= 70	F
S098	Fluorine, Organic	< 0.01	%
S195	% Water (Karl Fisher)	1.2	%
S950	Acid Digestion		
S971	Ashing		
S980	Oxygen Bomb Preparation		
W032	Ammonia - Distillation (as N)	< 10	mg/l
W050	BOD, 5-day (O2)	> 180000	mg/l
W116	Organic Carbon(non-purgeable)	INT	
W435	Nitrogen, Kjeldahl (N)	44	mg/l
W440	Nitrogen, Organic (N)	44	mg/l
W765	Total Sulfur (S)-gravimetric	400	mg/l

COMMENTS: NO ADDTIONAL VOLATILE ORGANICS WERE DETECTED. INT FOR TOC DUE TO SAMPLE MATRIX INTERFERENCE.

Reviewed and Approved by: JMC

JUN 10 '96

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Group
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

COMPOSITE OF SOLVENT STILL SLUDGE

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
ATTENTION: MR. DAVE MAZZOCCO

REPORT DATE: 06/04/87

NUS CLIENT NO: 321909
NUS SAMPLE NO: 17041493
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 04/24/87

SAMPLE IDENTIFICATION: CV-87-0180-03

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.05	mg/l
M140	Chromium (Cr)	< 0.1	mg/l
M200	Lead (Pb)	< 0.3	mg/l
M250	Mercury (Hg)	0.12	mg/l
OF01	Xylenes	330000	mg/l
OF05	2-Butanone(MEK)	< 16000	mg/l
OF08	4-Methyl-2-Pentanone(MIBK)	34000	mg/l
OF99	Volatile Organic Scan		
OM10	Ethylbenzene	9.6	%
OM32	Butyl Cellosolve	< 0.1	%
OM50	Petroleum naphtha	< 1	%
OM57	n-Butanol	< 0.1	%
OM58	i-Butanol	< 0.1	%
OM59	t-Butanol	< 0.1	%
OM64	Methyl Amyl Ketone	< 0.1	%
OP80	Total PCBs	< 10	mg/kg
OV06	Carbon Tetrachloride	< 8000	mg/l
OV22	Methylene Chloride	< 8000	mg/l
OV25	Toluene	35000	mg/l
OV30	Trichlorofluoromethane	< 8000	mg/l
S015	% Ash at 550 C	< 0.1	%
S040	British Thermal Units	16700	BTU/lb
S064	Chlorine, Organic	< 0.1	%
S090	Flash Point (Pensky-Marten)	< 70	F
S098	Fluorine, Organic	< 0.01	%
S168	Specific Weight	7.3	lb/gal
S195	% Water (Karl Fisher)	0.06	%
S210	Viscosity	10	CP
S950	Acid Digestion		
S971	Ashing		
S980	Oxygen Bomb Preparation		
W032	Ammonia - Distillation (as N)	39	mg/l

RECEIVED
JUN 10 1987
ENVIRONMENTAL ENGINEERING

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Group
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

COMPOSITE OF SOLVENT STILL SLUDGE

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
REPORT DATE: 06/04/87
ATTENTION: MR. DAVE MAZZOCCO

NUS CLIENT NO: 321909
NUS SAMPLE NO: 17041493
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 04/24/87

SAMPLE IDENTIFICATION: CV-87-0180-03

TEST	DETERMINATION	RESULTS	UNITS
W435	Nitrogen, Kjeldahl (N)	540	mg/l
W440	Nitrogen, Organic (N)	500	mg/l
W620	Solids, Total at 103 C	97900 9.8%	mg/l
W765	Total Sulfur (S)-gravimetric	680	mg/l

TENTATIVELY IDENTIFIED COMPOUNDS	ESTIMATED RESULT (mg/L)
3-Methyl Hexane	5,300
Butyl Ester, Acetic Acid	21,000
Unknown Alkane	35,000

CAK 6/8/87

RECEIVED
JUN 10 1987
ENVIRONMENTAL ENGINEERING
& CONTROL DEPARTMENT

COMMENTS:

Reviewed and Approved by: JMC

CLIENT ORIGINAL

NUS CORPORATION

Laboratory Services Group
5350 Campbells Run Road
Pittsburgh, PA 15205
412-788-1080

REMIT TO:
Park West Two
Cliff Mine Road
Pittsburgh, PA 15275

RECEIVED
JUN 10 1987
ENVIRONMENTAL ENGINEERING
& CONTROL DEPARTMENT

WASTE RESIN

LAB ANALYSIS REPORT

CLIENT NAME: PPG INDUSTRIES, INC.
ADDRESS: 260 KAPPA DRIVE
PITTSBURGH, PA 15238
ATTENTION: MR. DAVE MAZZOCCO

REPORT DATE: 06/04/87

NUS CLIENT NO: 321909
NUS SAMPLE NO: 17041494
VENDOR NO: 01831710
WORK ORDER NO: 55830
DATE RECEIVED: 04/24/87

SAMPLE IDENTIFICATION: CV-87-0181-03

TEST	DETERMINATION	RESULTS	UNITS
M050	Beryllium (Be)	< 0.05	mg/l
M140	Chromium (Cr)	< 0.1	mg/l
M200	Lead (Pb)	< 0.3	mg/l
M250	Mercury (Hg)	0.006	mg/l
OF99	Volatile Organic Scan		
OM32	Butyl Cellosolve	< 0.1	%
OP80	Total PCBs	< 10	mg/kg
OV06	Carbon Tetrachloride	< 8000	mg/l
OV22	Methylene Chloride	< 8000	mg/l
OV25	Toluene	92000	mg/l
OV30	Trichlorofluoromethane	< 8000	mg/l
S015	% Ash at 550 C	< 0.1	%
S040	British Thermal Units	16000	BTU/lb
S064	Chlorine, Organic	< 0.1	%
S090	Flash Point (Pensky-Marten)	< /= 65	F
S098	Fluorine, Organic	< 0.01	%
S168	Specific Weight	7.4	lb/gal
S195	% Water (Karl Fisher)	3.5	%
S210	Viscosity	10	CP
S950	Acid Digestion		
S971	Ashing		
S980	Oxygen Bomb Preparation		
W032	Ammonia - Distillation (as N)	17	mg/l
W435	Nitrogen, Kjeldahl (N)	370	mg/l
W440	Nitrogen, Organic (N)	350	mg/l
W620	Solids, Total at 103 C	113000	mg/l
W765	Total Sulfur (S)-gravimetric	420	mg/l

COMMENTS:

IDENTIFIED COMPOUNDS	RESULT (mg/L)
4-Methyl-2-Pentanone	42,000
Ethylbenzene	59,000
Total Xylenes	230,000
TENTATIVELY IDENTIFIED COMPOUNDS	**ESTIMATED RESULT (mg/L)**
Hexane,3-Methyl-	6,300
Acetic Acid, Butyl Ester	13,000

CAK
6/8/87

Reviewed and Approved by: JMC

CLIENT ORIGINAL

ATTACHMENT 5

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXADRC101
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 9
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PER CENT TOT. SOLIDS	17.01	45.07	27.10	7.760
PER CENT ASH	0.01	0.55	0.17	0.200
PER CENT WATER	48.31	81.21	58.36	9.410
ORGANIC HALOGEN %	0.01	0.80	0.43	0.290
ORGANIC NITROGEN %	0.14	0.99	0.48	0.280
ORGANIC SULFUR %	0.01	0.46	0.11	0.130
HEAVY METALS (ppm)				
ARSENIC	0.00	0.00	0.00	0.000
BARIUM	0.00	2.20	0.63	0.730
BERYLLIUM	0.00	0.00	0.00	0.000
CADMIUM	0.00	1.10	0.37	0.337
CHROMIUM	0.00	4.60	1.06	1.329
LEAD	0.00	269.00	53.28	79.570
MERCURY	0.00	0.00	0.00	0.000
SELENIUM	0.00	0.00	0.00	0.000
SILVER	0.00	3.50	1.00	1.344
ALUMINUM	0.00	64.90	17.59	19.150
ORGANIC CONSTITUENTS %				
MEK	0.00	2.00	0.97	0.620
1-BUTANOL	0.00	0.10	0.01	0.031
MIBK	0.00	9.40	4.38	2.950
TOLUENE	0.00	0.30	0.13	0.094
BUTYL ACETATE	0.00	0.70	0.30	0.226
ETHYL BENZENE	0.00	0.50	0.29	0.145
XYLENE	0.00	2.30	1.52	0.720
BUTYL CELLOSOLVE	0.10	9.20	5.04	2.980
CELLO. ACETATE	0.00	0.00	0.00	0.000
DEG.METHYL ETHER	0.00	0.00	0.00	0.000
HEXYL CELLOSOLVE	0.00	2.10	0.57	0.585
ISOPHORONE	0.00	0.00	0.00	0.000
DEG. BUTYL ETHER	0.00	1.80	0.86	0.512
NAPHTHALENE	0.00	0.00	0.00	0.000
MAK	0.00	0.10	0.01	0.031
ETHYL ACETATE	0.00	0.00	0.00	0.000
ISOBUTYL ACETATE	0.00	0.00	0.00	0.000
ALIPHATIC HYDROCAR	0.00	0.00	0.00	0.000
ALKYL BENZENES	0.00	0.80	0.13	0.270
ISOBUTANOL	0.00	0.10	0.01	0.031
ETHYLENE GLYCOL	0.00	0.00	0.00	0.000
PCB'S	0.00	0.00	0.00	0.000
ETHYL CELLOSOLVE	0.00	2.80	0.31	0.880
METHYLENE CHLORIDE	0.00	0.90	0.27	0.330
TDI	0.00	0.00	0.00	0.000

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXADRC101
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 9
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PHYSICAL PROPERTIES				
VISCOSITY	35	440	119	117.280
TOT. SETT. SOLIDS	0.01	0.01	0.01	0.000
HEATING VALUE	143	8864	5344	2862.490
FLASH POINT	78.00	136.00	85.25	19.180
WEIGHT/GALLON	8.18	8.78	8.41	0.200
pH	5.50	7.00	6.33	0.530

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXADRC102
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 10
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PER CENT TOT. SOLIDS	12.67	63.79	51.38	14.280
PER CENT ASH	0.00	0.37	0.10	0.140
PER CENT WATER	27.92	27.92	27.92	0.000
ORGANIC HALOGEN %	0.00	0.19	0.07	0.050
ORGANIC NITROGEN %	0.00	0.19	0.08	0.060
ORGANIC SULFUR %	0.01	0.13	0.04	0.040
HEAVY METALS (ppm)				
ARSENIC	0.00	0.00	0.00	0.000
BARIUM	0.00	4.60	1.91	1.660
BERYLLIUM	0.00	0.00	0.00	0.000
CADMIUM	0.10	1.40	0.52	0.387
CHROMIUM	0.00	2.30	0.74	0.614
LEAD	0.00	12.10	1.67	3.640
MERCURY	0.00	0.00	0.00	0.000
SELENIUM	0.00	0.00	0.00	0.000
SILVER	0.00	2.10	0.61	0.730
ALUMINUM	0.00	32.10	18.00	10.090
ORGANIC CONSTITUENTS %				
MEK	0.00	22.20	3.70	8.270
1-BUTANOL	0.00	0.00	0.00	0.000
MIBK	0.00	2.00	0.38	0.730
TOLUENE	0.00	0.20	0.03	0.075
BUTYL ACETATE	0.00	0.40	0.07	0.149
ETHYL BENZENE	0.00	0.90	0.15	0.335
XYLENE	0.00	4.30	0.72	1.600
BUTYL CELLOSOLVE	0.00	1.60	0.35	0.590
CELLO. ACETATE	0.00	0.00	0.00	0.000
DEG.METHYL ETHER	0.00	0.00	0.00	0.000
HEXYL CELLOSOLVE	0.00	0.00	0.00	0.000
ISOPHORONE	0.00	0.00	0.00	0.000
DEG. BUTYL ETHER	0.00	0.40	0.08	0.146
NAPHTHALENE	0.00	0.00	0.00	0.000
MAK	0.00	0.00	0.00	0.000
ETHYL ACETATE	0.00	0.00	0.00	0.000
ISOBUTYL ACETATE	0.00	0.00	0.00	0.000
ALIPHATIC HYDROCAR	0.00	2.50	0.42	0.930
ALKYL BENZENES	0.00	2.00	0.33	0.750
ISOBUTANOL	0.00	0.40	0.07	0.149
ETHYLENE GLYCOL	0.00	0.00	0.00	0.000
PCB'S	0.00	0.00	0.00	0.000
ETHYL CELLOSOLVE	0.00	0.00	0.00	0.000
METHYLENE CHLORIDE	0.00	0.00	0.00	0.000
TDI	0.00	0.00	0.00	0.000

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXADRC102
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 10
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PHYSICAL PROPERTIES				
VISCOSITY	50	50	50	0.000
TOT. SETT. SOLIDS	100.00	100.00	100.00	0.000
HEATING VALUE	10107	14556	13010	1649.260
FLASH POINT	78.00	78.00	78.00	0.000
WEIGHT/GALLON	8.69	8.69	8.69	0.000
pH	6.00	6.00	6.00	0.000

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXADRC104
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 2
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PER CENT TOT. SOLIDS	24.30	43.24	33.77	9.470
PER CENT ASH	0.01	0.10	0.06	0.050
PER CENT WATER	38.89	97.73	68.31	29.420
ORGANIC HALOGEN %	0.00	0.01	0.01	0.010
ORGANIC NITROGEN %	0.05	2.01	1.03	0.980
ORGANIC SULFUR %	0.02	0.06	0.04	0.020
HEAVY METALS (ppm)				
ARSENIC	0.00	0.00	0.00	0.000
BARIUM	2.70	6.40	4.55	1.850
BERYLLIUM	0.00	0.00	0.00	0.000
CADMIUM	1.00	1.20	1.10	0.100
CHROMIUM	1.00	2.70	1.85	0.850
LEAD	0.00	8.50	4.25	4.250
MERCURY	0.00	0.00	0.00	0.000
SELENIUM	0.00	0.00	0.00	0.000
SILVER	0.00	0.00	0.00	0.000
ALUMINUM	38.10	45.30	41.70	3.600
ORGANIC CONSTITUENTS %				
MEK	0.00	0.00	0.00	0.000
1-BUTANOL	0.00	0.00	0.00	0.000
MIBK	0.00	0.00	0.00	0.000
TOLUENE	0.00	0.00	0.00	0.000
BUTYL ACETATE	0.00	0.00	0.00	0.000
ETHYL BENZENE	0.00	0.00	0.00	0.000
XYLENE	0.00	0.00	0.00	0.000
BUTYL CELLOSOLVE	0.00	0.00	0.00	0.000
CELLO. ACETATE	0.00	0.00	0.00	0.000
DEG.METHYL ETHER	0.00	0.00	0.00	0.000
HEXYL CELLOSOLVE	0.00	0.00	0.00	0.000
ISOPHORONE	0.00	0.00	0.00	0.000
DEG. BUTYL ETHER	0.00	5.70	2.85	2.850
NAPHTHALENE	0.00	0.00	0.00	0.000
MAK-	0.00	0.00	0.00	0.000
ETHYL ACETATE	0.00	0.00	0.00	0.000
ISOBUTYL ACETATE	0.00	0.00	0.00	0.000
ALIPHATIC HYDROCAR	0.00	0.00	0.00	0.000
ALKYL BENZENES	0.00	0.00	0.00	0.000
ISOBUTANOL	0.00	0.00	0.00	0.000
ETHYLENE GLYCOL	0.00	0.00	0.00	0.000
PCB'S	0.00	0.00	0.00	0.000
ETHYL CELLOSOLVE	0.00	0.00	0.00	0.000
METHYLENE CHLORIDE	0.00	0.00	0.00	0.000
TDI	0.00	0.00	0.00	0.000

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXADRC104
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 2
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PHYSICAL PROPERTIES				
VISCOSITY	210	1850	1030	820.000
TOT. SETT. SOLIDS	0.00	0.00	0.00	0.000
HEATING VALUE	200	8367	4284	4083.500
FLASH POINT	78.00	78.00	78.00	0.000
WEIGHT/GALLON	8.51	9.12	8.82	0.310
pH	7.00	8.00	7.50	0.500

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXDRSF111
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 14
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PER CENT TOT. SOLIDS	7.13	96.05	57.02	25.620
PER CENT ASH	0.14	19.46	4.04	6.010
PER CENT WATER	1.13	1.13	1.13	0.000
ORGANIC HALOGEN %	0.00	2.72	0.33	0.710
ORGANIC NITROGEN %	0.00	1.72	0.22	0.530
ORGANIC SULFUR %	0.01	0.10	0.03	0.030
HEAVY METALS (ppm)				
ARSENIC	0.00	0.00	0.00	0.000
BARIUM	0.10	39.00	9.92	10.480
BERYLLIUM	0.00	0.20	0.02	0.058
CADMIUM	0.30	1.70	0.75	0.377
CHROMIUM	0.00	7.50	2.69	2.681
LEAD	0.00	80.10	9.41	21.060
MERCURY	0.00	0.00	0.00	0.000
SELENIUM	0.00	0.00	0.00	0.000
SILVER	0.00	0.40	0.13	0.126
ALUMINUM	11.60	2059.50	242.95	542.940
ORGANIC CONSTITUENTS %				
MEK	0.00	30.90	3.12	9.260
1-BUTANOL	0.00	1.00	0.11	0.298
MIBK	0.00	11.10	1.27	3.310
TOLUENE	0.00	3.70	0.47	1.117
BUTYL ACETATE	0.00	4.80	0.61	1.449
ETHYL BENZENE	0.00	2.60	0.29	0.775
XYLENE	0.00	12.80	1.44	3.820
BUTYL CELLOSOLVE	0.00	4.80	0.59	1.440
CELLO. ACETATE	0.00	0.00	0.00	0.000
DEG.METHYL ETHER	0.00	0.00	0.00	0.000
HEXYL CELLOSOLVE	0.00	34.70	3.47	10.410
ISOPHORONE	0.00	0.00	0.00	0.000
DEG. BUTYL ETHER	0.00	0.10	0.01	0.030
NAPHTHALENE	0.00	0.00	0.00	0.000
MAK	0.00	1.10	0.12	0.328
ETHYL ACETATE	0.00	0.00	0.00	0.000
ISOBUTYL ACETATE	0.00	0.00	0.00	0.000
ALIPHATIC HYDROCAR	0.00	0.50	0.05	0.150
ALKYL BENZENES	0.00	2.40	0.28	0.720
ISOBUTANOL	0.00	0.10	0.01	0.030
ETHYLENE GLYCOL	0.00	0.00	0.00	0.000
PCB'S	0.00	0.00	0.00	0.000
ETHYL CELLOSOLVE	0.00	0.00	0.00	0.000
METHYLENE CHLORIDE	0.00	0.00	0.00	0.000
TDI	0.00	0.00	0.00	0.000

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXDRSF111
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 14
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PHYSICAL PROPERTIES				
VISCOSITY	145	145	145	0.000
TOT. SETT. SOLIDS	0.00	0.00	0.00	0.000
HEATING VALUE	3502	14883	9587	3155.500
FLASH POINT	78.00	78.00	78.00	0.000
WEIGHT/GALLON	8.03	8.03	8.03	0.000
pH	0.00	0.00	0.00	0.000

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXODRF101
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 11
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PER CENT TOT. SOLIDS	31.36	82.20	57.60	14.720
PER CENT ASH	0.02	17.57	3.10	6.480
PER CENT WATER	0.62	19.96	3.61	5.660
ORGANIC HALOGEN %	0.00	0.38	0.06	0.100
ORGANIC NITROGEN %	0.00	0.76	0.15	0.220
ORGANIC SULFUR %	0.00	0.06	0.02	0.020
HEAVY METALS (ppm)				
ARSENIC	0.00	0.00	0.00	0.000
BARIUM	0.10	16.40	4.38	5.640
BERYLLIUM	0.00	0.00	0.00	0.000
CADMIUM	0.30	1.20	0.72	0.301
CHROMIUM	0.00	2.30	1.26	0.620
LEAD	0.00	42.90	5.18	12.500
MERCURY	0.00	0.00	0.00	0.000
SELENIUM	0.00	0.00	0.00	0.000
SILVER	0.00	6.60	1.23	2.254
ALUMINUM	4.80	35.20	16.68	8.130
ORGANIC CONSTITUENTS %				
MEK	0.00	3.50	0.35	1.000
1-BUTANOL	0.00	6.60	1.06	2.279
MIBK	0.00	9.20	2.96	2.820
TOLUENE	0.00	9.50	1.33	2.651
BUTYL ACETATE	0.00	1.90	0.49	0.636
ETHYL BENZENE	0.00	6.10	1.61	2.125
XYLENE	0.00	36.40	9.38	12.770
BUTYL CELLOSOLVE	0.00	26.80	7.37	9.230
CELLO. ACETATE	0.00	0.00	0.00	0.000
DEG.METHYL ETHER	0.00	0.00	0.00	0.000
HEXYL CELLOSOLVE	0.00	0.70	0.13	0.234
ISOPHORONE	0.00	0.00	0.00	0.000
DEG. BUTYL ETHER	0.00	1.30	0.16	0.372
NAPHTHALENE	0.00	0.00	0.00	0.000
MAK	0.00	0.70	0.13	0.226
ETHYL ACETATE	0.00	0.00	0.00	0.000
ISOBUTYL ACETATE	0.00	0.00	0.00	0.000
ALIPHATIC HYDROCAR	0.00	28.70	2.87	8.210
ALKYL BENZENES	0.00	8.60	1.25	2.430
ISOBUTANOL	0.00	0.10	0.01	0.029
ETHYLENE GLYCOL	0.00	0.00	0.00	0.000
PCB'S	0.00	0.00	0.00	0.000
ETHYL CELLOSOLVE	0.00	1.30	0.12	0.374
METHYLENE CHLORIDE	0.00	0.00	0.00	0.000
TDI	0.00	0.00	0.00	0.000

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXODRF101
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 11
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PHYSICAL PROPERTIES				
VISCOSITY	80	22580	3198	6596.150
TOT. SETT. SOLIDS	0.00	0.00	0.00	0.000
HEATING VALUE	7261	16314	14427	2455.720
FLASH POINT	78.00	78.00	78.00	0.000
WEIGHT/GALLON	7.55	8.81	8.17	0.360
pH	0.00	0.00	0.00	0.000

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXODRF102
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 9
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PER CENT TOT. SOLIDS	24.34	77.33	41.93	15.480
PER CENT ASH	0.04	0.07	0.06	0.020
PER CENT WATER	0.34	4.15	1.07	1.110
ORGANIC HALOGEN %	0.00	0.08	0.02	0.030
ORGANIC NITROGEN %	0.03	1.73	0.47	0.570
ORGANIC SULFUR %	0.00	0.06	0.03	0.020
HEAVY METALS (ppm)				
ARSENIC	0.00	0.00	0.00	0.000
BARIUM	0.20	102.90	12.67	31.920
BERYLLIUM	0.00	0.00	0.00	0.000
CADMIUM	0.00	1.00	0.58	0.315
CHROMIUM	0.00	13.20	2.36	3.888
LEAD	0.00	0.70	0.10	0.220
MERCURY	0.00	0.00	0.00	0.000
SELENIUM	0.00	0.00	0.00	0.000
SILVER	0.00	4.60	0.79	1.388
ALUMINUM	3.60	40.20	18.80	11.920
ORGANIC CONSTITUENTS %				
MEK	0.00	0.40	0.14	0.140
1-BUTANOL	0.00	4.30	1.23	1.576
MIBK	0.60	17.80	7.66	5.550
TOLUENE	0.00	60.10	8.10	18.410
BUTYL ACETATE	0.00	46.50	8.97	14.620
ETHYL BENZENE	0.00	4.30	1.19	1.301
XYLENE	0.00	18.60	5.69	5.780
BUTYL CELLOSOLVE	0.00	27.00	7.19	8.780
CELLO. ACETATE	0.00	0.00	0.00	0.000
DEG.METHYL ETHER	0.00	0.00	0.00	0.000
HEXYL CELLOSOLVE	0.00	0.00	0.00	0.000
ISOPHORONE	0.00	0.00	0.00	0.000
DEG. BUTYL ETHER	0.00	26.70	2.97	8.391
NAPHTHALENE	0.00	0.00	0.00	0.000
MAK	0.00	0.60	0.07	0.189
ETHYL ACETATE	0.00	0.00	0.00	0.000
ISOBUTYL ACETATE	0.00	0.00	0.00	0.000
ALIPHATIC HYDROCAR	0.00	20.40	4.66	6.570
ALKYL BENZENES	0.00	4.70	1.16	1.680
ISOBUTANOL	0.00	0.10	0.02	0.042
ETHYLENE GLYCOL	0.00	0.00	0.00	0.000
PCB'S	0.00	0.00	0.00	0.000
ETHYL CELLOSOLVE	0.00	18.40	2.04	5.783
METHYLENE CHLORIDE	0.00	0.70	0.08	0.220
TDI	0.00	0.00	0.00	0.000

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXODRF102
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 9
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PHYSICAL PROPERTIES				
VISCOSITY	25	1870	734	603.830
TOT. SETT. SOLIDS	0.00	0.00	0.00	0.000
HEATING VALUE	13567	16633	15178	1139.170
FLASH POINT	78.00	78.00	78.00	0.000
WEIGHT/GALLON	7.21	9.00	8.07	0.540
pH	0.00	0.00	0.00	0.000

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXCCLF101
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 6
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PER CENT TOT. SOLIDS	10.86	49.89	21.17	13.440
PER CENT ASH	0.09	13.78	3.53	4.890
PER CENT WATER	7.22	90.26	37.68	31.470
ORGANIC HALOGEN %	2.01	60.42	22.73	19.680
ORGANIC NITROGEN %	0.01	0.37	0.12	0.130
ORGANIC SULFUR %	0.02	0.38	0.09	0.130
HEAVY METALS (ppm)				
ARSENIC	0.00	0.00	0.00	0.000
BARIUM	0.60	211.70	38.60	77.540
BERYLLIUM	0.00	0.00	0.00	0.000
CADMIUM	0.30	1.80	0.93	0.502
CHROMIUM	1.00	41.90	8.75	14.840
LEAD	0.00	198.20	40.20	71.270
MERCURY	0.00	0.00	0.00	0.000
SELENIUM	0.00	0.00	0.00	0.000
SILVER	0.00	0.10	0.02	0.037
ALUMINUM	0.00	1058.30	225.60	380.070
ORGANIC CONSTITUENTS %				
MEK	0.00	4.50	1.62	1.650
1-BUTANOL	0.00	0.20	0.06	0.080
MIBK	0.00	3.70	1.36	1.350
TOLUENE	0.00	1.50	0.46	0.546
BUTYL ACETATE	0.00	1.40	0.50	0.537
ETHYL BENZENE	0.00	0.90	0.34	0.307
XYLENE	0.00	4.80	1.72	1.640
BUTYL CELLOSOLVE	0.10	2.30	0.90	0.810
CELLO. ACETATE	0.00	0.00	0.00	0.000
DEG.METHYL ETHER	0.00	0.00	0.00	0.000
HEXYL CELLOSOLVE	0.00	0.00	0.00	0.000
ISOPHORONE	0.00	0.00	0.00	0.000
DEG. BUTYL ETHER	0.00	0.00	0.00	0.000
NAPHTHALENE	0.00	0.00	0.00	0.000
MAK	0.00	0.50	0.10	0.200
ETHYL ACETATE	0.00	0.00	0.00	0.000
ISOBUTYL ACETATE	0.00	0.00	0.00	0.000
ALIPHATIC HYDROCAR	0.00	2.30	0.46	0.920
ALKYL BENZENES	0.00	2.40	0.48	0.960
ISOBUTANOL	0.00	0.10	0.02	0.040
ETHYLENE GLYCOL	0.00	0.00	0.00	0.000
PCB'S	0.00	0.00	0.00	0.000
ETHYL CELLOSOLVE	0.00	0.00	0.00	0.000
METHYLENE CHLORIDE	3.60	48.80	28.84	15.810
TDI	0.00	0.00	0.00	0.000

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXCCLF101
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 6
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PHYSICAL PROPERTIES				
VISCOSITY	35	1145	326	473.050
TOT. SETT. SOLIDS	2.00	50.00	20.67	21.000
HEATING VALUE	1877	8108	5410	2207.580
FLASH POINT	78.00	110.00	86.00	13.860
WEIGHT/GALLON	8.80	9.91	9.31	0.400
pH	2.00	2.00	2.00	0.000

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXOCWF101
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 45
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PER CENT TOT. SOLIDS	0.20	9.65	1.38	1.660
PER CENT ASH	0.00	0.59	0.13	0.190
PER CENT WATER	0.85	100.00	76.03	33.670
ORGANIC HALOGEN %	0.00	0.04	0.01	0.010
ORGANIC NITROGEN %	0.00	1.31	0.14	0.290
ORGANIC SULFUR %	0.00	0.08	0.02	0.020
HEAVY METALS (ppm)				
ARSENIC	0.00	0.00	0.00	0.000
BARIUM	0.00	28.10	2.28	5.630
BERYLLIUM	0.00	0.10	0.00	0.015
CADMIUM	0.00	1.40	0.40	0.344
CHROMIUM	0.00	9.80	0.93	1.669
LEAD	0.00	15.30	0.84	2.690
MERCURY	0.00	0.00	0.00	0.000
SELENIUM	0.00	0.00	0.00	0.000
SILVER	0.00	11.80	1.38	2.681
ALUMINUM	0.00	76.70	9.76	12.690
ORGANIC CONSTITUENTS %				
MEK	0.00	8.50	0.55	1.840
1-BUTANOL	0.00	0.20	0.02	0.058
MIBK	0.00	14.00	2.06	3.470
TOLUENE	0.00	26.60	2.24	4.863
BUTYL ACETATE	0.00	1.80	0.17	0.411
ETHYL BENZENE	0.00	9.80	1.58	2.903
XYLENE	0.00	44.30	6.20	11.330
BUTYL CELLOSOLVE	0.00	2.10	0.24	0.380
CELLO. ACETATE	0.00	0.00	0.00	0.000
DEG.METHYL ETHER	0.00	0.00	0.00	0.000
HEXYL CELLOSOLVE	0.00	0.00	0.00	0.000
ISOPHORONE	0.00	0.00	0.00	0.000
DEG. BUTYL ETHER	0.00	0.10	0.00	0.015
NAPHTHALENE	0.00	0.00	0.00	0.000
MAK	0.00	0.10	0.00	0.015
ETHYL ACETATE	0.00	0.00	0.00	0.000
ISOBUTYL ACETATE	0.00	0.00	0.00	0.000
ALIPHATIC HYDROCAR	0.00	10.50	0.59	2.110
ALKYL BENZENES	0.00	37.50	4.40	9.490
ISOBUTANOL	0.00	0.60	0.03	0.125
ETHYLENE GLYCOL	0.00	0.00	0.00	0.000
PCB'S	0.00	0.00	0.00	0.000
ETHYL CELLOSOLVE	0.00	0.20	0.00	0.029
METHYLENE CHLORIDE	0.00	0.40	0.03	0.090
TDI	0.00	0.00	0.00	0.000

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXOCWF101
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 45
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PHYSICAL PROPERTIES				
VISCOSITY	10	35	12	4.200
TOT. SETT. SOLIDS	0.01	4.00	1.30	1.260
HEATING VALUE	100	18421	4055	6601.770
FLASH POINT	78.00	78.00	78.00	0.000
WEIGHT/GALLON	6.86	8.45	8.16	0.320
pH	2.00	9.00	3.00	1.710

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXSSLF101
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 55
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PER CENT TOT. SOLIDS	10.99	66.33	36.34	11.820
PER CENT ASH	0.00	0.38	0.09	0.090
PER CENT WATER	0.00	30.23	6.41	6.700
ORGANIC HALOGEN %	0.01	0.88	0.22	0.200
ORGANIC NITROGEN %	0.00	2.28	0.39	0.450
ORGANIC SULFUR %	0.00	0.16	0.02	0.030
HEAVY METALS (ppm)				
ARSENIC	0.00	0.00	0.00	0.000
BARIUM	0.00	23.80	1.86	4.300
BERYLLIUM	0.00	0.10	0.00	0.013
CADMIUM	0.00	2.10	0.46	0.396
CHROMIUM	0.00	4.00	0.68	0.734
LEAD	0.00	6.10	0.24	1.020
MERCURY	0.00	0.00	0.00	0.000
SELENIUM	0.00	0.00	0.00	0.000
SILVER	0.00	12.60	1.19	2.369
ALUMINUM	0.00	40.40	10.19	8.760
ORGANIC CONSTITUENTS %				
MEK	0.00	3.50	1.43	0.950
1-BUTANOL	0.00	3.80	0.40	0.565
MIBK	2.00	43.70	13.25	7.640
TOLUENE	0.00	5.70	1.60	1.190
BUTYL ACETATE	0.10	4.50	2.57	1.079
ETHYL BENZENE	0.10	4.20	1.98	1.068
XYLENE	0.60	27.40	11.40	7.010
BUTYL CELLOSOLVE	2.40	23.10	9.59	4.570
CELLO. ACETATE	0.00	0.00	0.00	0.000
DEG.METHYL ETHER	0.00	0.00	0.00	0.000
HEXYL CELLOSOLVE	0.00	2.00	0.35	0.555
ISOPHORONE	0.00	0.40	0.01	0.066
DEG. BUTYL ETHER	0.00	6.20	1.31	1.317
NAPHTHALENE	0.00	0.60	0.04	0.120
MAK	0.00	4.10	0.86	0.750
ETHYL ACETATE	0.00	0.00	0.00	0.000
ISOBUTYL ACETATE	0.00	0.00	0.00	0.000
ALIPHATIC HYDROCAR	0.00	7.00	1.88	2.140
ALKYL BENZENES	0.00	10.30	4.62	2.560
ISOBUTANOL	0.00	1.00	0.27	0.253
ETHYLENE GLYCOL	0.00	0.00	0.00	0.000
PCB'S	0.00	0.00	0.00	0.000
ETHYL CELLOSOLVE	0.00	0.00	0.00	0.000
METHYLENE CHLORIDE	0.00	1.30	0.17	0.320
TDI	0.00	0.00	0.00	0.000

MAXMIN REPORT 02/04/91

CODENAME / FAMILY FOR DATA BEING GENERATED: CRXSSLF101
DATES FOR WHICH THIS DATA WAS COMPILED: 01/01/90 TO 12/31/90
NUMBER OF DATA POINTS (RECEIPT SAMPLES) FOUND FOR THIS CODE: 55
(ALL ZEROES INDICATES NO DATA WAS FOUND FOR THAT FIELD)

DATA FIELD	MIN	MAX	AVG	STD DEV
PHYSICAL PROPERTIES				
VISCOSITY	1	2470	218	388.310
TOT. SETT. SOLIDS	0.01	17.00	6.34	7.580
HEATING VALUE	10232	23335	14376	1968.230
FLASH POINT	78.00	78.00	78.00	0.000
WEIGHT/GALLON	7.30	9.15	8.20	0.380
pH	0.00	0.00	0.00	0.000

ATTACHMENT 6

Faxed to J. Kirk 6/21/88; AM

ANALYSIS REPORT

LANCY ENVIRONMENTAL SERVICES
DIVISION OF LANCY INTERNATIONAL, INC.
An Alcoa Separations Technology Company
P.O. Box 419
Pittsburgh, PA 15230-0419
Phone (412) 772-0044 • FAX (412) 772-0055

FAX MACHINE (412) 772-1360

PPG - Coatings & Resins
RIDC Park
260 Kappa Drive
Pittsburgh, PA 15238

Attention: Dave Mazzocco

JUN 16 1988

Report Date	6/15/88		
Sample Date	6/2/88	by	JR
Received	6/3/88	by	FM
Analyzed	6/3 - 6/14/88	by	Staff
No. of Samples	3		
Purchase Order #	Verbal		

Analysis of Soil Samples — Project #20818

		INCINERATOR ASH	REFRACTORY BRICK
	CU-88-0155-06	CU-88-0156-06	CU-88-0157-06
Lab Reference #	8060105	8060106	8060107
	(mg/L)	(mg/L)	(mg/L)
TCLP ZHE Leachate			
Acetone	<0.05	<0.05	<0.05
n-butyl-alcohol	<5.0	<5.0	<5.0
Carbon disulfide	<1.05	<1.05	<1.05
Carbon tetrachloride	<0.05	<0.05	<0.05
Chlorobenzene	<0.15	<0.15	<0.15
2-methylphenol (o-cresol)	<2.82	<2.82	<2.82
3-methylphenol (m-cresol)	<2.82	<2.82	<2.82
4-methylphenol (p-cresol)	<2.82	<2.82	<2.82
Cresylic acid	<2.82	<2.82	<2.82
Cyclohexanone	<0.125	<0.125	<0.125
1,2-dichlorobenzene	<0.65	<0.65	<0.65
Ethyl acetate	<0.05	<0.05	<0.05
Ethyl benzene	<0.05	<0.05	<0.05
Ethyl ether	<0.05	<0.05	<0.05
Isobutnol	<5.0	<5.0	<5.0
Methanol	<1.0	<1.0	<1.0
Methylene chloride	<0.20	<0.20	<0.20
Methylene chloride (from pharmaceutical industry)	<12.7	<12.7	<12.7
Methyl ethyl ketone	<0.05	<0.05	<0.05
Methyl isobutyl ketone	<0.05	<0.05	0.140
Nitrobenzene	<0.66	<0.66	<0.66
Pyridine	<1.12	<1.12	<1.12
Tetrachloroethylene	<0.079	<0.079	<0.079
Toluene	<1.12	<1.12	<1.12
1,1,1-trichloroethane	<1.05	<1.05	<1.05
1,1,2-trichloro-1,2,2-trifluoroethane	<1.05	<1.05	<1.05
Trichloroethylene	<0.062	<0.062	<0.062
Trichlorofluoromethane	<0.05	<0.05	<0.05
Xylene	<0.05	<0.05	<0.05

JUN 1988 RECEIVED

C. John Ritzert, Manager-Technical Operations

LANCY ENVIRONMENTAL SERVICES
DIVISION OF LANCY INTERNATIONAL, INC.
An Alcoa Separations Technology Company
P.O. Box 419
Pittsburgh, PA 15230-0419
Phone (412) 772-0044 • FAX (412) 772-0055

ANALYSIS REPORT

PPG - Coatings & Resins
RIDC Park
260 Kappa Drive
Pittsburgh, PA 15238

Attention: Dave Mazzocco

Report Date 6/15/88 (Rev. 8/24/88)
Sample Date 6/2/88 by JR
Received 6/3/88 by FM
Analyzed 6/3 - 6/14/88 by Staff
No. of Samples 3
Purchase Order # Verbal

Analysis of Soil Samples

Project #20818

		INCINERATOR ASH	REFRACTORY BRICK
	CU-88-0155-06	CU-88-0156-06	CU-88-0157-06
Lab Reference #	8060105	8060106	8060107
	(mg/L)	(mg/L)	(mg/L)
TCLP ZHE Leachate			
Chlorobenzene	<0.05	<0.05	<0.05
2-methylphenol (o-cresol)	<0.75	<0.75	<0.75
3-methylphenol (m-cresol)	<0.75	<0.75	<0.75
4-methylphenol (p-cresol)	<0.75	<0.75	<0.75
Cresylic acid	<0.75	<0.75	<0.75
1,2-dichlorobenzene	<0.125	<0.125	<0.125
Methanol	<1.0	<1.0	<1.0
Nitrobenzene	<0.125	<0.125	<0.125
Pyridine	<0.33	<0.33	<0.33
Tetrachloroethylene	<0.05	<0.05	<0.05
Toluene	<0.33	<0.33	<0.33
1,1,1-trichloroethane	<0.41	<0.41	<0.41
1,1,2-trichloro-1,2,2-trifluoroethane	<0.96	<0.96	<0.96

C. John Ritzert, Manager-Technical Operations

ATTACHMENT G

U.S. EPA Risk Assessment Forum
Dioxin and Furan Toxicity Equivalence Factor Tables

Interim Procedures for Estimating Risks Associated with Exposures to Mixtures of Chlorinated Dibenzo-*p*-Dioxins and -Dibenzofurans (CDDs and CDFs)

October 1986

Authors
Judith S. Bellin, Ph.D.
Office of Solid Waste and Emergency Response

Donald G. Barnes, Ph.D.
Office of Pesticides and Toxic Substances

Technical Panel
Co-Chairmen: Donald G. Barnes (OPTS)
Hugh L. Spitzer (ORD)

Steven Bayard, Ph.D. (ORD)
Irwin Baumel, Ph.D. (OPTS)
Judith Bellin, Ph.D. (OSWER)
David Cleverly, M.S. (OAQPS)
Frank Gostomski, Ph.D. (ODW/OWRS)
Charalingayya Hiremath, Ph.D. (ORD)
Paul Milvy, Ph.D. (OPPE)
Abe Mittelman, M.S. (OSWER)
Debdas Mukerjee, Ph.D. (ORD)
Charles Nauman, Ph.D. (ORD)
Jerry Stara, Ph.D., D.V.M. (ORD)

Risk Assessment Forum Staff
Dorothy E. Patton, Ph.D., J.D., Executive Director

Risk Assessment Forum
U.S. Environmental Protection Agency
Washington, DC 20460

Table 1. Some Approaches to Estimating Relative Toxicities of PCDDs and PCDFs

Basis/ compound	Swiss[a]	Grant[b] Olie[c] Commoner[d]	New York State[e]	Ontario[f]	FDA[g]	CA[h]	EPA[i] 1981	EPA current recommend.
(Basis)	Enzyme		LD_{50}	Various effects	Various effects			Various effects
Mono thru di CDDs	0	0	0	0	0	0	0	0
Tri CDDs	0	0	0	1	0	0	0	0
2378-TCDD	1	1	1	1	1	1	1	1
other TCDDs	0.01	1	0	0.01	0	0	1	0.01
2378-PeCDDs	0.1	0.1	1	1	0	1	0	0.5
other PeCDDs	0.1	0.1	0	0.01	0	0	0	0.005
2378-HxCDDs	0.1	0.1	0.03	1	0.02	1	0	0.04
other HxCDDs	0.1	0.1	0	0.01	0.02	0	0	0.0004
2378-HpCDDs	0.01	0.1	0	1	0.005	1	0	0.001
other HpCDDs	0.01	0.1	0	0.01	0.005	0	0	0.00001
OCDD	0	0	0	0	<0.00001	1	0	0
2378-TCDFs	0.1	0.1	0.33	0.02	0	1	0	0.1
other TCDFs	0.1	0.1	0	0.0002	0	0	0	0.001
2378-PeCDFs	0.1	0.1	0.33	0.02	0	1	0	0.1
other PeCDFs	0.1	0.1	0	0.0002	0	0	0	0.001
2378-HxCDFs	0.1	0.1	0.01	0.02	0	1	0	0.01
other HxCDFs	0.1	0.1	0	0.0002	0	0	0	0.0001
2378-HpCDFs	0.1	0.1	0	0.02	0	1	0	0.001
other HpCDFs	0	0.1	0	0.0002	0	0	0	0.00001
OCDF	0	0	0	0	0	0	0	0

Table 1. (continued)

[a] Swiss Government, 1982.
[b] Grant, 1977.
[c] Olie et al., 1983.
[d] Commoner et al., 1984.
[e] Eadon et al., 1982.
[f] Ontario, 1982.
[g] U.S. DHHS, 1983.
[h] Gravitz et al., 1983.
[i] U.S. EPA, 1981.

ATTACHMENT H

Documentation of Partial Closure Activities in 1989

REPORT OF CLOSURE ACTIVITIES AND CERTIFICATION OF CLOSURE FOR PPG'S CIRCLEVILLE, OHIO, FACILITY

Submitted to:

PPG Industries, Inc.
Circleville, Ohio

O.H. Materials Corp.

Shirley McMaster

Shirley McMaster, P.E.
Senior Project Engineer

November 17, 1989
Project 7137

TABLE OF CONTENTS

1.0 INTRODUCTION

PPG Industries, Inc. (PPG) is undergoing closure of four RCRA hazardous waste management units. These units are:

- o Still Pad Drum Storage Area
- o South Pad Storage Area
- o West Drum Storage Area
- o Liquid Waste Incinerator Area

PPG is in the process of revising the closure plan for submittal to the Ohio Environmental Protection Agency (Ohio EPA) for final approval.

At PPG's discretion, certain closure activities have taken place prior to the final submittal and subsequent approval of the closure plan. PPG has kept the Ohio EPA advised as to when the closure activities would take place; also, all of Ohio EPA's comments on the closure plan made during the appeal process were taken into account during closure activities. These closure activities have been completed.

2.0 SCOPE OF WORK

OHM was contracted to perform the following tasks:

- Still Pad Drum Storage Area
  - Wash and rinse the pad
  - Collect and drum the rinsewater
  - Sample and analyze the final rinsate
  - Sample and analyze sediment in two grated cover manholes
  - Provide the professional engineer's Closure Certification
- South Pad and West Drum Storage Areas
  - Sample and analyze area soils
  - Remove all concrete pads
  - Provide the professional engineer's Closure Certification
- Liquid Waste Incinerator Area
  - Dismantle the incinerator
  - Sample and analyze area soils
  - Sample and analyze the rinsates from flushing the organic waste and aqueous waste feed lines
  - Remove all concrete pads
  - Provide the professional engineer's Closure Certification

3.0 METHODS

The following sections describe closure activities and analytical methods.

3.1 STILL PAD DRUM STORAGE AREA

The Still Pad Area was an uncurbed concrete pad approximately 80 feet by 100 feet. There were two grated sewer inlets and two sealed sewer manholes located within the pad area.

OHM operations personnel and the professional engineer mobilized to the site on April 17, 1989. There were no drums on the pad. PPG had previously scarified the top 1/4-inch of the pad. This material was placed into 55-gallon drums and disposed of in Chemical Waste Management of Indiana's TSD. facility in Fort Wayne, Indiana (ADAMS CENTER).

OHM installed temporary foam curbing around the pad perimeter and the four sewer inlets. The pad was washed twice with an industrial cleaner and rinsed three times with high pressure water lasers. The rinsewater was collected with wet/dry vacuums and placed in drums. Each of the three rinses were placed in separate drums.

At the completion of the third rinse, the foam was removed and placed in separate drums. In all, 15 drums of liquids and solids were generated:

- o First rinse--three drums
- o Second rinse--four drums
- o Third rinse--three drums
- o Foam dike--four drums
- o Trash, protective clothing--one drum

Samples of the three drums of the third rinse were obtained for analyses. A separate 4 foot long dip tube was used for each drum to ensure sampling of the entire drum contents. Each sample container was filled with equal volumes from each drum.

A sample was also obtained from the plant water used as the rinsewater source. The sample was taken from a tap in the Still House.

OHM also obtained sediment grab samples from the bottom of the two grated cover manholes.

Clean glass containers with Teflon-lined lids were used for all samples. Chain-of-custody forms accompanied all samples.

All 15 drums of rinsate and debris were incinerated on site at the hazardous-waste incinerator.

3.2 SOUTH PAD STORAGE AREA

The South Pad is a gravel area, approximately 90 feet by 240 feet. There is a curbed concrete pad, approximately 15 feet by 45 feet located on the south side of the area.

OHM sampling personnel mobilized to the site on July 17, 1989, to perform soil sampling on the South Pad Storage Area, the West Drum Storage Area, and the Liquid Waste Incinerator Area.

Using a grid established by PPG, and the edge of an existing concrete pad as the western boundary of the South Pad, OHM located the sample points. A sample was taken from the center of each box shown as shaded on Figure 3.1.

A power auger was used to remove the top 4 to 6 inches. The loose soil was removed and a grab sample collected using a tongue depressor where necessary to loosen the soil. The samples were placed in clean glass 40 milliliter (ml) vials with Teflon septa.

The power auger bit was decontaminated using a soap and water wash and distilled water rinse between each location.

The sample gloves and tongue depressors were discarded after each location. All samples were labeled and transferred to the laboratory in coolers. Chain-of-custody forms accompanied all samples.

The holes were backfilled after the sample had been obtained. The decontamination water was placed in one drum, and trash and debris placed in another drum.

On November 7, 1989, the concrete containment pad was broken up, removed, and transported to ADAMS CENTER.

3.3 WEST DRUM STORAGE AREA

The West Drum Storage Area is a gravel area, approximately 10 feet by 100 feet.

Using a grid supplied by PPG and an existing monitoring well as the northwest corner of the area, OHM located the sample points. These points are shown in Figure 3.2.

The samples were obtained in a fashion similar to that described in Section 3.2 for the South Pad Storage Area.

3.4 LIQUID WASTE INCINERATOR AREA

The liquid waste incinerator has been taken out of service.

G

PLOT SCALE: 1" = 1"

OHM CORPORATION
PITTSBURGH, PA

DRAWN BY | CHECKED BY | APPROVED BY | DRAWING NUMBER 137-A3

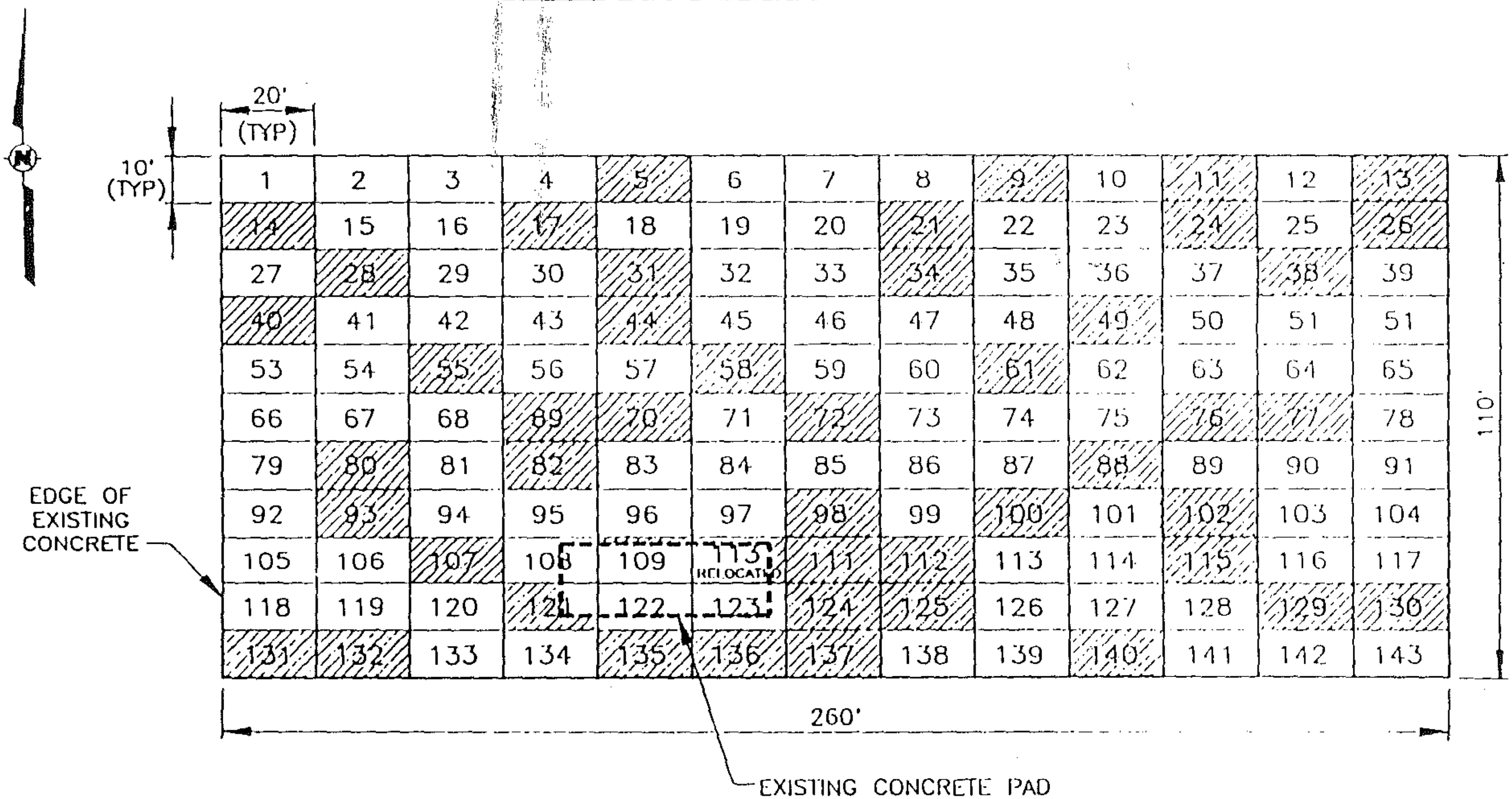


FIGURE 3.1

SOUTH PAD
SAMPLE LOCATION MAP

PREPARED FOR

PPG INDUSTRIES
CIRCLEVILLE, OHIO

OHM Corporation

PLOT SCALE: 1" = 1"

	OHM CORPORATION PITTSBURGH, PA	DRAWN		CHECKED BY		APPROVED BY		DRAWING NUMBER	-A1
		J. ABRAMS	5-30-89						
	REV. BY	C.MERKIN	11-10-89						

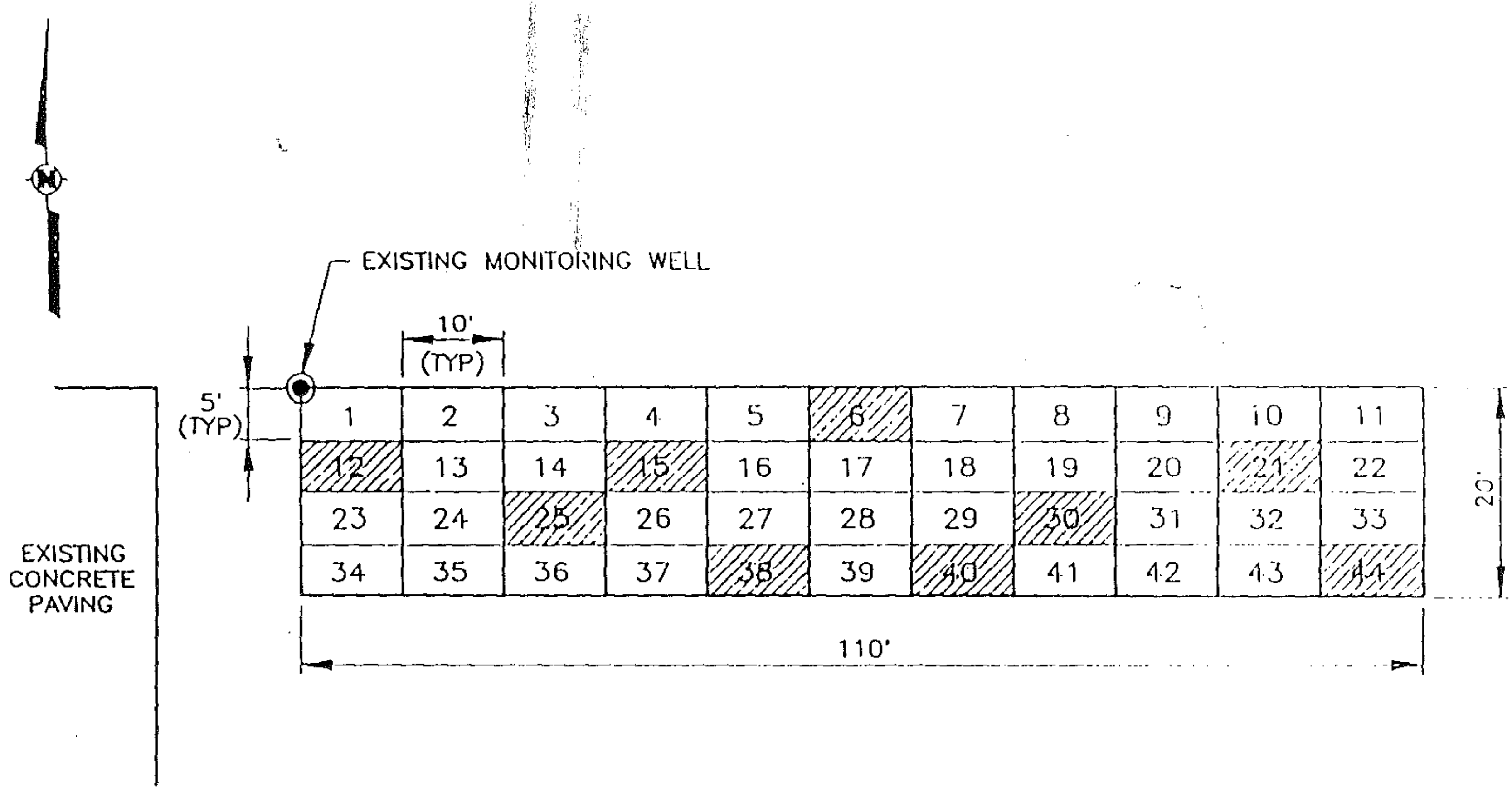


FIGURE 3.2

WEST PAD
SAMPLE LOCATION MAP

PREPARED FOR

PPG INDUSTRIES
CIRCLEVILLE, OHIO

OHM Corporation

On June 5, 6, and 7, 1989, OHM dismantled the incinerator hearth, breech, and stack, and loaded them into trucks for transport to ADAMS CENTER.

3.4.1 Soil Sampling

An area surrounding the incinerator pad was selected for soil sampling. The incinerator occupied a concrete pad approximately 10 feet by 40 feet along with a 20 foot square concrete containment area. The area to be sampled was 90 feet by 110 feet.

Using PPG's sampling grid, OHM located the sample points shown on Figure 3.3. The northwest corner of the area was selected 23 feet north and 29 feet west of the corner of the incinerator pad. Three samples were relocated in the field: Location 9 was moved south and east to avoid an existing equipment pad; Location 48 was moved east off the incinerator pad; Location 78 was moved east outside an electrical substation.

All soil sampling activities were similar to those described in Section 3.2, South Pad Storage Area.

3.4.2 Line Flushing

There were three pipelines at the Liquid Waste Incinerator that carried hazardous materials. Two of the lines were designated as organic waste feed lines and the other as an aqueous waste feed line. The lines were flushed and drained when the incinerator was taken down. The lines were to be flushed again as part of the closure activities.

OHM's professional engineer was on site on August 24, 1989, to witness the flushing and obtain rinsate samples.

The two organic feed lines were flushed first. A recycle line on the pipe rack was used to recirculate the solvent solution. For each organic line, solvent was circulated at least three times and then sent to PPG's on-site hazardous-waste incineration facility.

Following the solvent flushing, service water was used for the final flushing. Three rinses with clean water were performed. Each rinse was segregated in a separate drum and sent to the on-site incinerator.

The aqueous waste line was flushed three times with deionized water. Each rinse was segregated in a separate drum and incinerated on site.

PLOT SCALE: 1" = 1'

OHM CORPORATION PITTSBURGH, PA	DRAWN	B.O'Connor	8-30-89
	DRAWN BY	C.MERRIN	11-17-89

CHECKED BY

APPROVED BY

DRAWING NUMBER -A2

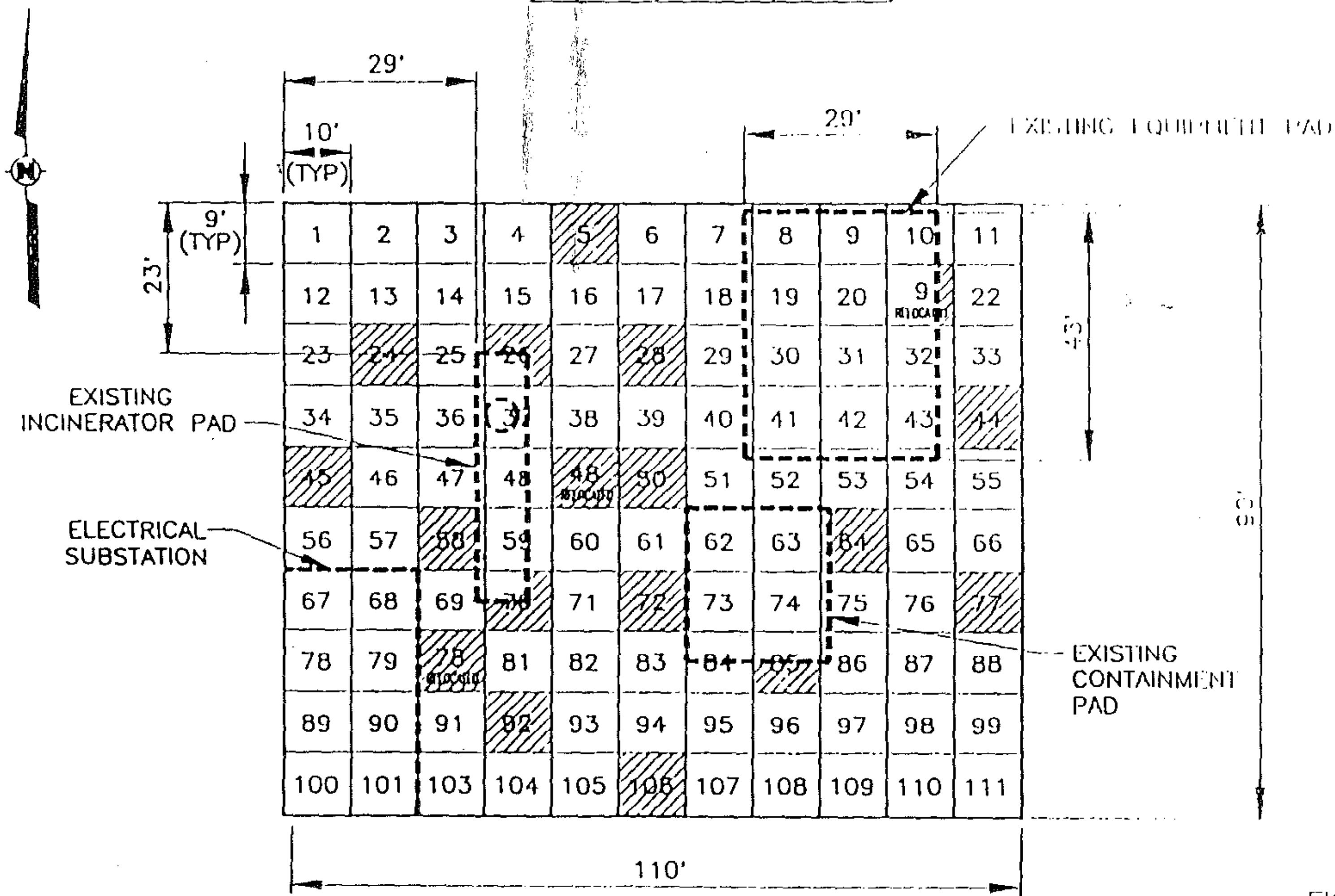


FIGURE 3.3

INCINERATOR AREA
SAMPLE LOCATION MAP

PREPARED FOR

PPG INDUSTRIES
CIRCLEVILLE, OHIO

OHM Corporation

The three final rinsewaters were sampled. Four-foot long dip tubes were used to ensure a representative sample was obtained from each drum. Samples were also taken from the hose used to supply the service water and a drum of the clean deionized water. The samples were placed in clean glass jars with Teflon-lined lids. Clean dip tubes and sample gloves were used to take each sample. The containers were held in coolers during transport to the laboratory. Chain-of-custody forms accompanied all samples.

3.4.3. Concrete Removal

On November 7 and 8, 1989, CHM removed the concrete incinerator pad and containment. The footings for the incinerator pad were removed to a few inches below grade. The concrete was transported to ADAMS CENTER.

3.5 ANALYTICAL METHODS

All the samples obtained (soils, rinsates, and source waters) were analyzed for F003 and F005 solvents using the following methods:

- o Alcohols--Samples were prepared and analyzed according to USEPA Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods, EPA SW-846, 2nd edition, July 1982; Method 5030, Purge and Trap, and Method 8015, Nonhalogenated Volatile Organics.

- o Volatile Priority Pollutants--Samples were prepared and analyzed according to USEPA Test Methods for Evaluating Solid Wastes, Physical/ Chemical Methods, SW-846, 3rd edition, September 1986; Method 8240, GC/MS Method for Volatile Organics.

The final rinsate at the Still Pad Storage Area was also analyzed for methylene chloride and acrylonitrile by the above methods and for PCBs by the following method:

- o PCBs--The water sample was prepared and analyzed according to USEPA Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater, July 1982; Method 608, Pesticides and PCBs.

The soil samples at the South Pad Storage Area, West Drum Storage Area, and the incinerator area were composited and analyzed for PCBs according to the following method:

- o USEPA Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods, SW-846, 2nd edition, July 1982; Method 3550, Sonication or Method 3540, Soxhlet Extraction and Method 8080, Organochlorine Pesticides and PCBs.

The samples at the South Pad were composited into two samples--one encompassing samples S-131, 003 through 14, and 016 through 026; the other samples 027 through 032, and 034 through 051. The 18 nonduplicate samples at the West Drum Storage Area were composited into one sample and the nine non-duplicate samples at the incinerator area were composited into one sample.

The composite soil sample from the incinerator area was analyzed for the following:

- o <u>Polychlorinated Dibenzo-P-Dioxins and Furans, namely 2,3,7,8-TCDD and 2,3,7,8-TCDF</u>--Sample was prepared and analyzed according to USEPA <u>Methods for Evaluating Solid Wastes, Physical/Chemical Methods</u>, SW-846, 3rd edition, November 1986; Method 8280, GC/MS Method for Polychlorinated Dibenzo-P-Dioxins and Furans.

4.0 RESULTS

The following paragraphs discuss the results of the closure activities.

4.1 STILL PAD DRUM STORAGE PAD

Of the F003 and F005 solvents analyzed, none were detected in the still pad final rinsate sample. There were no PCBs, acrylonitrile, or toluene diisocyanate detected in the final rinsate. Methylene chloride was detected at 169 parts per billion (ppb).

The rinsate was sent to PPG's Circleville incineration facility. The concrete pad was demolished and sent to ADAMS CENTER. The drums of debris from the scarification of the pad were also sent to ADAMS CENTER.

4.2 SOUTH PAD STORAGE AREA

The results of the F003 and F005 analyses on the 50 soil samples have been summarized in Table 4.1. Only those 16 sample points which had detectable concentrations are shown in the table. One composite sample had 0.334 ppm PCBs, the other 3.56 ppm PCBs. These soils will be addressed at a future time.

4.3 WEST DRUM STORAGE AREA

A total of 10 samples were taken at the West Drum Storage Area. The F003 and F005 solvent concentrations have been summarized in Table 4.2. There were only four locations which had detectable concentrations. There were no PCBs detected in the composite sample. The soils in these areas will be addressed at a future time.

4.4 LIQUID WASTE INCINERATOR AREA

There were 19 soil samples taken at the incinerator area. Detectable F003 and F005 concentrations have been summarized in Table 4.3. Only nine locations were above detection limits. There was 1.79 ppm PCBs detected in the composite sample. There was 0.15 ppb of 2,3,7,8-TCDF present in the composite sample while the 2,3,7,8-TCDD was below detectable limits. The soils at these locations will be addressed at a future time.

The rinsate sample analyses for the aqueous waste and organic waste feed lines are summarized in Table 4.4. Detectable concentrations of several F003 and F005 solvents were present in all three final rinsates. The pipe was dismantled; no solids or residue were visible in the pipes. The pipes were sent to ADAMS CENTER for disposal.

TABLE 4.1

F003 AND F005 SOLVENTS
ANALYTICAL SUMMARY
SOILS - SOUTH PAD STORAGE AREA

Compounds Detected (ppm)

Sample Number	Location	Toluene	Total Xylenes	Ethylbenzene
S-131	S-131	2	BDL	BDL
004	S-135	BDL	0.11	BDL
005	S-136	0.8	BDL	BDL
010	S-125	0.4	BDL	BDL
013	S-107	0.4	BDL	BDL
015	S-109	BDL	0.6	BDL
018	S-112	0.4	BDL	BDL
021	S-100	21	8	2
024	S-80	0.5	BDL	BDL
025	S-88	2	BDL	BDL
028	S-76	17	BDL	0.3
029	S-72	BDL	BDL	0.4
031	S-69	1	1.8	0.3
034	S-58	0.3	BDL	BDL
035	S-61	0.3	BDL	BDL
038	S-40	0.4	BDL	BDL
Detection Limit	N/A	0.3	0.3	0.3

BDL = Below Detection Limit

TABLE 4.2

F003 AND F005 SOLVENTS
ANALYTICAL SUMMARY
SOILS - WEST PAD STORAGE AREA

Compounds Detected (ppm)

Sample Number	Location	Methanol	Toluene	Ethylbenzene	m+p-Xylene	o-Xylene
053	W-44	0.988	1.34	BDL	BDL	BDL
057	W-06	BDL	BDL	0.229	1.14	1.02
058	W-38	BDL	0.621	BDL	BDL	BDL
061	W-12	BDL	BDL	BDL	0.225	0.229
Detection Limit	N/A	.988	.19	.19	.19	.19

BDL = Below Detection Limit

TABLE 4.3

F003 AND F005 SOLVENTS
ANALYTICAL SUMMARY
SOILS - INCINERATOR AREA

Compounds Detected (ppm)

Sample Number	Location	Ethylbenzene	Total Xylenes
066	I-64	0.3	0.9
067	I-85	0.6	0.7
070	I-72	BDL	1.7
072	I-70	BDL	BDL
077	I-24	2	4
078	I-28	BDL	BDL
079	I-48	BDL	0.4
080	I-45	0.6	2
081	I-50	BDL	BDL
Detection Limit	N/A	0.3	0.3

BDL = Below Detection Limit

TABLE 4.4

F003 AND F005 SOLVENTS
ANALYTICAL SUMMARY
LIQUIDS - INCINERATOR AREA

Concentration (ppm)

Item	Methanol	Isobutanol	Butanol	Ethyl-benzene	Toluene	Total Xylenes
Organic Waste Line 1	16.5	1.71	18.9	24	33	180
Organic Waste Line 2	93.1	10.1	85.3	36	75	240
Aqueous Waste	BDL	BDL	BDL	9.9	15	31
Service Water	BDL	BDL	BDL	BDL	BDL	BDL
Deionized Water	BDL	BDL	BDL	BDL	.17*	BDL
Detection Limit	1.0	1.0	1.0	0.5	0.5	0.5

*Detection Limit - 5 parts per billion

5.0 CONCLUSIONS

The closure activities completed to date have been consistent with the specifications set forth in Ohio Administrative Code 3745-66-12 and the Ohio Environmental Protection Agency's Draft Closure Plan Review Guidance dated February 8, 1988.